SITE INSPECTION REPORT
FOR THE
AVERY RAILROAD DUMP AND ROUNDHOUSE SITE
CERCLIS ID NO. IDD984666313

Prepared for:

Contract No. 68-W9-0054
Work Assignment No. 54-17-0JZZ
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
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ABBREVIATIONS AND ACRONYMS

ARCS	Alternative Remedial Contract Strategy
ARDR	Avery Railroad Dump and Roundhouse
BNA	base-neutral-acid entractable organics
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CMSPR	Chicago, Milwaukee, St. Paul and Pacific Railroad
CRDL	contract-required detection limit (for organic compounds)
CRQL	contract-required quantitation limit (for inorganic compounds)
EPA	United States Environmental Protection Agency
IATA	International Air Transport Association
IDEQ	Idaho Division of Environmental Quality
IDWR	Idaho Department of Water Resources
MCL	maximum contaminant level
MSL	mean sea level
MS	matrix spike
MSD	matrix spike duplicate
MW	monitoring well
NPL	National Priorities List
PA	preliminary assessment
PCB	polychlorinated biphenyl
QAPP	Quality Assurance Program Plan
RR	railroad
RPD	relative percent difference
SI	site inspection
SQL	sample quantitation limit
TSOP	Technical Standard Operating Procedures
URS	URS Consultants, Inc.
USFS	United States Forest Service
USGS	United States Geological Survey
VOC	volatile organic compound
WA	Work Assignment

UNITS OF MEASURE

cfs	cubic foot per second
kg	kilogram
L	liter
lb	pound
mg	milligram
ppm	parts per million
μg	microgram

1.0 INTRODUCTION

Pursuant to United States Environmental Protection Agency (EPA) Contract No. 68-W9-0054 and Work Assignment (WA) No. 54-17-0JZZ, URS Consultants, Inc. (URS) conducted a site inspection (SI) of the Avery Railroad Dump and Roundhouse (ARDR) site located in Avery, Idaho. The EPA SI process is intended to evaluate actual or potential environmental or public health hazards at a particular site relative to other sites across the nation for the purpose of identifying remedial action priorities. The SI process is intended to collect sufficient data to enable evaluation of the site's potential for inclusion on the National Priorities List (NPL) and, for those sites determined to be NPL candidates, establish priorities for additional action. The SI process is also intended to determine the potential for the site to pose a threat to public health or the environment and to document the potential for the release of hazardous constituents from the site into the environment. The SI process and this SI do not include extensive or complete site characterization, contaminant fate determination, or quantitative risk assessment. This SI was performed to collect site samples and evaluate the results in an effort to confirm or deny site characteristics and area receptor information identified in the preliminary assessment (PA) stage.

This document presents the results of the ARDR SI in the following sections:

Section 1.0 Introduction - Summary of the purpose of the SI

Section 2.0 Background - Site description and history summary

Section 3.0 Potential Targets - Discussion of potential exposure pathways

Section 4.0 Sampling Program - Description of sampling conducted

Section 5.0 Sample Results and Discussion - Summary of data results

Section 6.0 References - List of cited references

2.0 BACKGROUND

Site Name: Avery Railroad Dump and Roundhouse
CERCLIS No. IDD984666313

Location: Avery Landing - St. Joe River Road
Avery, Idaho

Latitude: 47° 12′ 13.65″ North Longitude: 115° 49′ 15″ West

Legal: T45N R05E S15 NW 1/4 of the NW 1/4
T45N R05E S16 NE 1/4 of the NE 1/4

Site Owners: Potlatch Corporation
P.O. Box 386
St. Maries, Idaho 83861

Federal Highway Administration
Contact: Mr. Allan Stockman
610 E. 5th
Vancouver, Washington 98661
(206) 696-7751

Mr. David Thierault
Box 3322
Missoula, Montana 59806

Operator: The site is not operational.

Site Contact: Mr. Mike Fish, Construction Services Manager
Potlatch Corporation
P.O. Box 386
St. Maries, Idaho 83861
(208) 245-2585

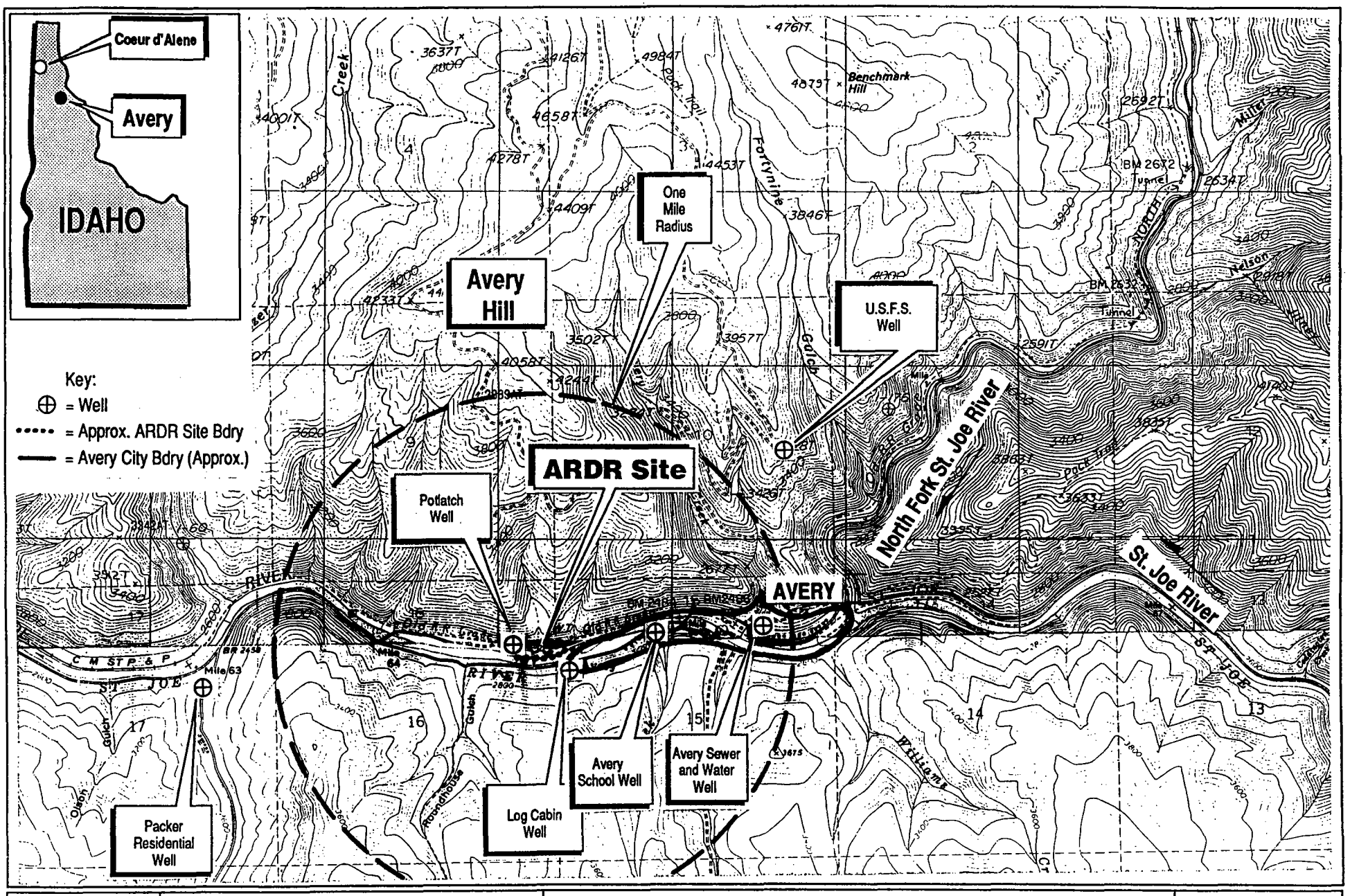
2.1 Site Location and Description

The ARDR site (approximately 7 acres) is located in northeastern Idaho in Shoshone County (Township 45 North, Range 5 East, Sections 15 and 16). The site is approximately 97 miles southeast of Coeur d'Alene, Idaho, and 46 miles east of St. Maries, Idaho. The ARDR site is about 1.2 miles west of the confluence of the St. Joe River and the North Fork of the St. Joe River and 0.75 mile west of the town of Avery, Idaho (Figure 2-1).

The Chicago, Milwaukee, St. Paul and Pacific Railroad (CMSPR) operated a rail yard on the site from 1909 until approximately 1977. The CMSPR retained ownership of the property until 1980 when its railroad holdings in northern Idaho, which included this parcel of land, were purchased by the Potlatch Corporation. At the time of this transaction, it was discovered that the easternmost 2 acres of the ARDR site were owned by David Thierault. The strip of land comprising the northern boundary of this property was sold to the Federal Highway Administration in 1986 for construction of the St. Joe River Road. Therefore, the ARDR site is owned by the Federal Highway Administration, Potlatch Corporation, and David Thierault.

The ARDR site lies at an elevation of approximately 2,540 feet above mean sea level (MSL). The St. Joe River Road and the foot of Avery Hill (peak elevation 4,417 feet MSL) lie along the northern border of the site (approximately 2,600 feet MSL). The site is bordered to the south by the St. Joe River (approximately 2,800 feet MSL). At the widest point, the distance across the site (from the St. Joe River Road to the St. Joe River), is approximately 300 feet. At the east and west ends of the site, the width of the property reduces to approximately 150 feet from the road to the river. The surface of the ARDR site is covered mostly with gravel, soil, or sparse vegetation. Buildings on the site include one on-site residence located on the western end of the site, several "camp" buildings on the western half of the site, and two old railroad buildings located in the central portion of the site. The eastern half of the site is shown in detail in Figure 2-2.

The site is located in a narrow river valley, with both commercial and residential areas nearby. The site itself is reportedly composed of fill materials that have been attributed to former railroad construction (IDEQ 1991a). Additional leveling and grading of the site was conducted by Potlatch after purchase of the property (Fish 1992). The well driller's log for the domestic well located on site, about 300 yards west of the site entrance, indicated approximately 18 feet of fill materials (IDWR 1979).



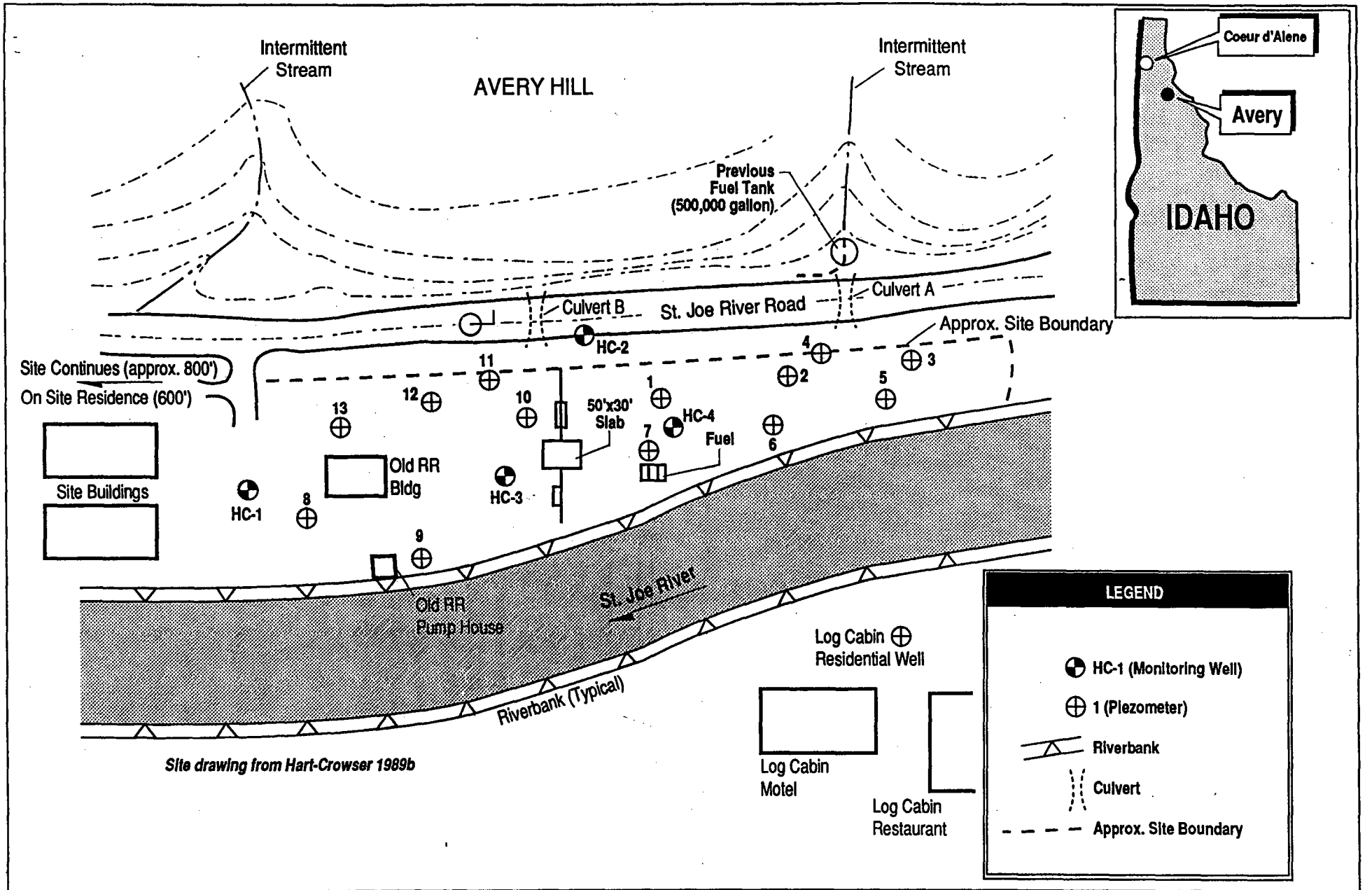
URS CONSULTANTS

Source: U.S.G.S. Topographic Quads

Figure 2-1
Site Location Map

Avery Railroad Dump and Roundhouse Avery, Idaho

PAL 002037



Site drawing from Hart-Crowser 1989b

PAL 002038

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NORTH

0 75 150

Scale In Feet

Figure 2-2
Site Map

Avery Railroad Dump and Roundhouse
Avery, Idaho

The St. Joe River Road, the north border of the site, is graded approximately 4 feet above the site. Two culverts divert runoff from Avery Hill under the roadway. One culvert (Culvert A on Figure 2-2) directs water from an intermittent stream, near the east end of the site, under the ARDR site to the St. Joe River. A second culvert (Culvert B on Figure 2-2) directs runoff from Avery Hill under the St. Joe River Road onto the central portion of the ARDR site. The ARDR site has an approximate 3 percent slope, with anticipated overland flow toward the south into the St. Joe River. The land immediately north, east, and west of the site is vacant and undeveloped. The St. Joe River is located immediately south of the site, and the opposite bank of the river is occupied by a restaurant and motel, the Log Cabin.

The residential population and commercial center of Avery are east of the ARDR site on both sides of the St. Joe River. The majority of the buildings in the town of Avery are spread along both the north and south banks of the St. Joe River for approximately 1 mile upstream (east) and 0.25 mile downstream (west). Six area wells serve the Avery population of approximately 100 permanent residents with an additional 60 to 80 seasonal workers (IDEQ 1991a). These wells are 1) the Log Cabin well located south of the St. Joe River, directly across from the eastern portion of the ARDR site; 2) the Avery elementary school well located on the south side of the St. Joe River approximately 0.25 mile east of the ARDR site; 3) the Avery Sewer and Water Department well, about 0.75 mile east of the ARDR site; 4) the United States Forest Service (USFS) well, 1.5 mile northeast of the ARDR site; 5) the Potlatch well, located approximately 300 yards west of the entrance into the ARDR site; and 6) the residential well, at the confluence of Fishhook Creek and the St. Joe River, approximately 1.0 mile west of the ARDR site. The approximate locations of these wells are shown in Figure 2-1. The closest permanently occupied building is located on site approximately 600 feet west of the site entrance. The western end of the site has been leased in the past to contractors housing workers in trailers. It was reported that a trailer park was located on this site from May through October of 1990 (Fish 1992).

2.2 Site Operations and Waste Characteristics

The ARDR site served as a switching station and light maintenance facility from 1909 until 1977. The CMSPR facility included a turntable, roundhouse, machine shop, fan house, engine house, boiler house, storehouses, coal dock, oil house, oil tanks (including a 500,000-gallon fuel oil tank), oil "sinks," various "drains," and a pumphouse (IDEQ 1991a). Before the property was purchased by the Potlatch Corporation in 1980, the

railroad removed most equipment and structures from the site, including the 500,000-gallon fuel oil tank (Fish 1992).

Since 1980, the ARDR site has been used by the Potlatch Corporation for staging, parking, and temporary log storage. "Camp" buildings (former railroad structures) on the site have been used by Potlatch employees for seasonal housing. Electrical connections are located on the site for temporary trailer use. In addition, the Potlatch Corporation allowed the Federal Highway Administration to use the site in 1986 for temporary housing during the construction of the St. Joe River Road (IDEQ 1991a). Other contractors, including the State of Idaho, and hunters (during elk and deer season) have used the property (some without requesting permission from the Potlatch Corporation) for seasonal or temporary housing and for a location to conduct maintenance on vehicles or equipment.

On-site waste generating activities by the CMSPR during operation of the railroad include train refueling, the use of solvents for cleaning engine parts or possibly hosing down locomotives, equipment maintenance, and possible on-site storage of transformers related to the electric railroad service (IDEQ 1991a). Other operations on the site since the Potlatch Corporation purchase include maintenance of equipment by Potlatch or the various site users, resulting in the potential for release of hazardous road construction materials (tar or asphalt). Site activities that may have contributed to the release of hazardous contaminants to the site and the surrounding area are summarized in Table 2-1.

Railroad operations were reported to have used a 500,000-gallon aboveground fuel oil tank for refueling the trains (IDEQ 1991a). The tank was reportedly located on the northeast end of the property in a gully. Fuel oil was stored and used at the site from 1909 until the railroad facility shut down operations in 1977. During the SI site visits, an intermittent stream (shown in Figure 2-2) was observed to be located in the gully where this tank was located (URS 1992a). A 1915 plat map of the site indicated the presence of a "50 foot oil service tank" where this 500,000-gallon fuel oil tank was reported to have been located (Appendix A). The volume of the tank was not shown on the map. The 1915 plat map showed an 8-inch pipe running from the tank to other site structures, including a smaller oil tank along the riverbank. In addition to this pipe that may have been used to transport the fuel oil to other site facilities, a 1.5-inch steam pipe is shown on the plat map. Common railroad operations in the 1900s involved the use of "Bunker C" oil, a thick oil for fueling trains. This type of oil has to be heated in order to be piped to any other location (URS 1992a). That may be the reason for the steam pipe

Table 2-1
Site Operations

Operator	Dates of Operation	Potential Activity	Potential Contaminants
CMSPR	1909-1977	Train fuel oil, site storage of fuel oil	Petroleum hydrocarbons
		Cleaning engine parts and possibly hosing down the locomotive with solvents[a]	Halogenated volatile compounds and waste oils containing metals
		On-site transformer storage	PCB-laden oils
Potlatch	1980-1992	Log storage, including possible maintenance of transport equipment on site	Solvents, waste oils containing metals
		Site rental to various contractors for worker housing, possible maintenance activities on site	Solvents, waste oils containing metals
Federal Highway Administration	1986	Worker housing and possible equipment maintenance during highway construction	Solvents, waste oils containing metals
State of Idaho	1992	Eastern end of site used for gravel storage and mixture of gravels and asphalt during road construction, equipment maintenance observed on site	Solvents, waste oils containing metals

Source: IDEQ 1991a, URS 1992a
[a]Not a documented site activity, but common railroad practice

indicated on the plat map. The fuel oil tank was reportedly removed from the site by the CMSPR after railroad operations ceased (Fish 1992). No records were discovered documenting the dismantling of railroad operations at this site. The railroad files included in the land purchase did not include documentation of activities after 1977 (Fish 1992).

The actual use or alleged improper disposal of solvents has not been documented at this site. However, the use of solvents for cleaning engine parts and even hosing down the locomotive was common practice at similar railroad facilities containing both a turntable and roundhouse (IDEQ 1991a). Interviews with former CMSPR employees revealed that the heavy maintenance of equipment was conducted at the railroad facility in Deer Lodge, Montana. Reportedly, the ARDR site was used for minor repairs (IDEQ 1991a), which may have resulted in the release of solvents, waste oils, and so forth onto the site.

The CMSPR facility in Avery was the end of the electric rail line heading east. A transformer substation was located near the Avery Sewer and Water well shown on Figure 2-1 (approximately 0.75 mile east of the site). This substation reportedly included tanks or vaults for storing transformer oil as well as the transformers (IDEQ 1991a). The use of PCB oils has not been documented. Former CMSPR employees recalled storing transformers on the ARDR site; the exact location or condition of these transformers was not known (IDEQ 1991a). Analytical data collected in 1989 indicated PCB in the floating layer of oily material that lies on top of the water column under the site (Hart-Crowser 1989a).

2.3 Investigative and Regulatory History

The regulatory history of the CMSPR facility is not accurately documented. Files were submitted to Potlatch from the railroad when the properties were purchased. Potlatch reviewed the files for information concerning deeds, transactions, and rights-of-way. The remaining file material does not contain information concerning any hazardous activities at this site (Davis 1993).

The EPA Idaho Operations Office reviewed the ARDR site as a potential hazardous waste site in August of 1988 (EPA 1988a). This review indicated that the site showed visible seepage running into the St. Joe River. The railroad operations were reported to have buried creosote-treated railroad ties at the site and the operations were suspected to have buried waste solvents, fuels, and old transformers at the site.

Potlatch contracted with Hart-Crowser to install groundwater monitoring wells and collect samples from the ARDR site. A 4-foot-thick free-phase hydrocarbon layer was measured in monitoring well HC-4. Hart-Crowser conducted two sampling events at this site: on July 26, 1989, a sample was collected of the floating oil layer in monitoring well (MW)-11 and on August 23, 1989, samples were collected of purged water from site

monitoring wells HC-1, HC-2, HC-3, and HC-4. The Hart-Crowser reports concluded that the wells HC-1 and HC-2 did not appear to be impacted by the petroleum hydrocarbons and the majority of the free-phase petroleum appears to lie beneath the eastern part of the site. The results from samples collected from these site wells are provided in Table 2-2 (Hart-Crowser 1989a, Hart-Crowser 1989b). Figure 2-2 shows the location of the Hart-Crowser wells.

Table 2-2
ARDR Site Historical Sample Data

Parameter	Water Sample Collected July 26, 1989, from MW-11	Purged Water Sample Collected August 23, 1989, from HC-3	Purged Water Sample Collected August 23, 1989, from HC-4
Arsenic	NA	0.009 ppm	ND
Cadmium	ND	ND	ND
Chromium	20 ppm	ND	1 ppm
Lead	30 ppm	ND	5 ppm
Total Petroleum Hydrocarbons	ND	ND	ND
PCB	1.4 ppm	NA	NA

Source: Hart-Crowser 1989a, Hart-Crowser 1989b

Notes:
NA - Not analyzed
ND - Not detected
ppm - parts per million

In addition to the analytical results from the Hart-Crowser investigation, a trench recovery system was proposed by Hart-Crowser for capture of the free-phase product currently moving into the river. This system proposes to dig a recovery trench along the riverbank and dispose of the recovered oily material through burning. The recovery system design was presented by Potlatch to the Idaho Department of Environmental Quality (IDEQ) to identify the magnitude of the problem and the cost of remediation

(Fish 1991, IDEQ 1991a). Following a meeting between the IDEQ, Federal Highway Administration, and Potlatch, comments were submitted from IDEQ to Potlatch concerning the changes requested for the recovery system. The IDEQ indicated that upon completion of the requested changes, the recovery system "would be satisfactory technology to attempt to remove free phase product from the Avery Landing site" (IDEQ 1991b). At the time of the SI sampling (August 1992), Potlatch had not initiated construction of the recovery system.

In May of 1991, the IDEQ submitted a PA of the ARDR site to EPA Region 10 (IDEQ 1991a). The PA reviewed the site history and evaluated the site based on its potential to release hazardous contaminants to the environment and the subsequent exposure of area residents to those potential hazardous contaminants. Based on the insufficient information available to characterize the site, a sampling SI was recommended. The results of this SI sampling are presented and discussed in Section 5.

3.0 POTENTIAL TARGETS

3.1 Groundwater Pathway

Soils in the Avery area consist of the Pywell Series (organic soil, very poorly drained) in the river bottoms and the Vay Series (erodible volcanic ash surface soil) on the mountain slopes (IDEQ 1991a). The ARDR surface site soil may not fall into either of these categories because it is composed mainly of fill materials.

The underlying water-bearing rock formations in the Avery area consist of Belt Formation Shales. The well log from the on-site Potlatch well (located approximately 300 yards west of the site entrance) indicates the top 18 feet of soil are composed of fill material (Table 3-1). The information in this well log is not consistent with other well logs from the nearby area; available well logs are provided in Appendix B.

Table 3-1
Potlatch Well Log

Depth below grade surface	Material	Depth to Water
0-18 feet	Fill	Depth to first water in this layer
18-30 feet	Cemented gravel	Static water level = 20 feet
30-31 feet	Soft area	Water encountered
31-57 feet	Brown shale	
57-58 feet	Fractured area	Water encountered
58-60 feet	Brown shale	
60-61 feet	Fractured area	Water encountered
61-64 feet	Brown shale	
64-67 feet	Fractured areas	Water encountered

Source: IDEQ 1991a

The geologic information provided in other area well logs indicates a groundwater depth of 24 feet. Of the well logs reviewed, only the Potlatch well indicated a series of layers of confining shale. Other wells in the area indicated only two or three layers of distinctive materials. Of these layers, a surface layer of shale was shown to have some confining effect on the water-bearing zone. The well driller's report for the Packer well, which appears to be representative of the area, is depicted in Table 3-2.

Table 3-2
Packer Well Log

Depth below grade surface	Material	Water
0-16 feet	Clay and shale	Static water level = 10 feet
16-24 feet	Shale	
24-175 feet	Shale	Depth to first water = 24 feet

Source: IDEQ 1991a

The information in available well logs indicates that the Avery area draws its water from a water-bearing unit that is overlaid by a 24-foot confining layer. This is based on the static water level information provided in the well logs. The ARDR site well log presents a perched water layer above the confining layer described in other well logs. This perched water may be a result of the 18 feet of fill that comprises the site. There is no evidence that the perched layer under the ARDR site is hydrologically isolated from the water-bearing zone indicated in the residential well logs.

Area drinking water wells within a 4-mile radius of the ARDR site are summarized in Table 3-3 and shown in Figure 2-1. There is no known use of local groundwater for irrigation or commercial purposes. The populations assigned to the wells in Table 3-3 were estimated by IDEQ based on conversations with the well owner (IDEQ 1991a). Within 0.25 mile of the ARDR site are two residential drinking water wells (Potlatch and Log Cabin). The Potlatch well provides water to an estimated maximum seasonal population of 20 people. The Log Cabin well provides water to one residence and the restaurant, bar, and motel, as well as eight trailers (available for seasonal use). From 0.25 to 0.5 mile from the site, the Avery school well provides water to 21 residents and 29 children and school personnel. At a distance of 0.5 to 1 mile from the site, the Avery Sewer and Water Department well provides water to the residential population on the

Table 3-3
Drinking Water Populations

Distance from site	Number of wells	Name of Well	Estimated population (range includes seasonal high)
0 - 1/4 mile	2	Potlatch and Log Cabin	8 - 48
1/4 - 1/2 mile	1	Avery School	21 - 50
1/2 - 1 mile	1	Avery Sewer and Water	65 - 75
1 - 2 miles	2	USFS and Packer	4 - 12
2 - 3 miles	0	none	
3 - 4 miles	0	none	
Total	6		98 -185

Source: IDEQ 1991a

north side of the river, estimated to range from 65 to 75 people. From 1 to 2 miles from the ARDR site, the USFS well provides water to a seasonal crew of 10 and the Packer well provides water to one residence.

Direction and rate of groundwater flow at this site have not been established. The groundwater flow in this valley may generally be toward the west following the land contours, whereas local and surface patterns may flow toward the St. Joe River.

The average annual precipitation for the Avery area is 36.65 inches; the 2-year, 24-hour rainfall is 1.8 inches. The average annual net precipitation was calculated to be 22.83 inches (Appendix C). The greatest amount of precipitation falls during the winter months.

The results of the groundwater sampling conducted during this SI are discussed in Section 5.

3.2 Surface Water Pathway

The ARDR site lies along 2,800 feet of the north bank of the St. Joe River. The St. Joe River is the only water body 15 miles downstream of the site. The monthly flow averages for the St. Joe River, measured at Calder (30 miles downstream), vary from a low of 500 cubic feet per second (cfs) to a high of 8,560 cfs. The average annual flow for the St. Joe River is 2,408 cfs (IDEQ 1991a).

No obvious overland surface water migration pathways across the site to the river were observed (URS 1992a). Culvert B (Figure 2-2) appeared to pond on site along the south side of the St. Joe River Road (URS 1992a). The site slopes at an approximate 3 percent grade toward the river. Several of the railroad buildings remain on the property, including what is assumed to be the pumphouse used by the railroad to draw water from the river. Former railroad operations on the site may have released hazardous materials to the river. There was no visual evidence that engineered systems (impervious flooring and containment walls under and around tanks for spill collection) for the containment of hazardous material spills were present at the site, which would have reduced the potential for release to the river (URS 1992a).

Former on-site operations have contributed to the presence of oily seeps occurring along the central 1,000 feet of the site riverbank. The largest seep is located just west of the former railroad pumphouse and was observed to cover an area of approximately 30 square feet of river bank (URS 1992a). This seep of oily material was observed entering the river from the site during low flow seasons (IDEQ 1991a, URS 1992a). The location of this seep is under water during high flow seasons, but the release of the oily substance is assumed to occur during the entire year (URS 1992a). A floating layer of oily material was observed on the perched water table at this site (Hart-Crowser 1989a, IDEQ 1991a, URS 1992a). The perched groundwater on site may be providing a conduit for transport of the oily material to the river.

The St. Joe River is not known to be used as a source of drinking or irrigation water within 15 miles downstream of the ARDR site. The river is used for sport fishing and is classified by the State of Idaho as a "Special Resource Water." The State of Idaho designated "Special Resource Waters" in 1980 based on the classification of a water in any of six categories: outstanding high quality, unique ecological system, outstanding recreational or aesthetic quality, need for intensive protection of the water, presence of water in a national or state park or wildlife refuge or a portion of the national wild and scenic river system, and need for maintaining an existing or beneficial use (Shumar

Based on a 1990 fish count of the St. Joe River, the average fish production is estimated to be 710 lb/mile (IDEQ 1991a). National Wetland Inventory maps are not yet available for this area of Idaho and no wetlands have been delineated 15 miles downstream of the ARDR site (Allen 1992). Floodplain evaluations have not been conducted in this area of Shoshone County (IDEQ 1991a). Historical reports have indicated that the highest river level recorded did not flood this site (IDEQ 1991a). The site lies approximately 15 feet above the river bottom (URS 1992a).

River sediment sampling results for this SI are discussed in Section 5.

3.3 Soil Exposure Pathway

This site is seasonally used for temporary housing for as many as 20 people (IDEQ 1991a). There is one on-site residence that is occupied by one person. This residence is located on the western third of the property approximately 600 feet west of the site entrance. There are no schools or daycares within 200 feet of the site. There are no known sensitive environments located within a 4-mile radius of the site. Access to this site is not restricted; there is no fence around the property. Observations during field sampling documented access to the site by area wildlife (mule deer) and residents (URS 1992a). The maximum residential population within a 4-mile radius of the ARDR site is estimated in Table 3-4.

Results from the soil sampling conducted during this SI are discussed in Section 5.

3.4 Air Pathway

Discolored soils and stains were observed along the riverbank and at several locations on the site. Photographic documentation of the discolored soils are provided in Appendix D. The observed discolored soils provide the potential for release of hazardous contaminants from the site into the air. No containment was observed at this site to reduce the potential for release of contaminants (URS 1992a).

No wetlands or sensitive environments have been identified within a 4-mile radius of the site. The number of residents within 4 miles of this site are tabulated in Table 3-4. Air sampling was not conducted during this SI.

Table 3-4
Residential Population

Distance from Site	Population
On site	20[a]
0 - 1/8 mile	10
1/8 - 1/4 mile	18
1/4 - 1/2 mile	50
1/2 - 1 mile	75
1 - 2 miles	12
2 - 3 miles	0
3 - 4 miles	0
Total	185

[a]Estimated number of maximum seasonal residents

Source: IDEQ 1991a

4.0 SAMPLING PROGRAM

4.1 Sampling Objectives

The sampling conducted for this SI was intended to gather sufficient data to enable evaluation of the site's potential for inclusion on the NPL. Site-specific sampling objectives for the ARDR SI included identifying the presence or absence of detectable CERCLA contaminants in area drinking water wells, river sediments, groundwater at the site, site oily seep, site surface soils, and site subsurface soils (URS 1992b).

4.2 Sampling Methods

The media-specific sampling procedures conducted during the sampling of the ARDR site are consistent with methodologies described in the URS Quality Assurance Program Plan (QAPP) (URS 1990a) and Technical Standard Operating Procedures (TSOP) (URS 1990b) for ARCS contract activity, as well as those described in the EPA Compendium of Superfund Field Operations Methods (EPA 1987). Table 4-1 contains a detailed list of the samples collected during the sampling at the ARDR site. The sampling methods are described in the following sections. The residential well and river sediment sample locations are shown in Figure 4-1. The on-site soil and oily seep sample locations are shown in Figure 4-2.

4.2.1 Residential Groundwater Samples (TSOP 5.1)

The well sample collected from the Avery Sewer and Water well was collected as a background water sample to characterize the area groundwater. Residential groundwater sampling at the Avery elementary school well (WSW01 and WSW02) was conducted to evaluate the potential for a health concern in the Avery area. These wells do not chlorinate the water supply. This groundwater sampling was intended only as a screening of wells near the site.

These sampling locations are shown in Figure 4-1.

Table 4-1
Summary of Sample Types, Numbers, and Location

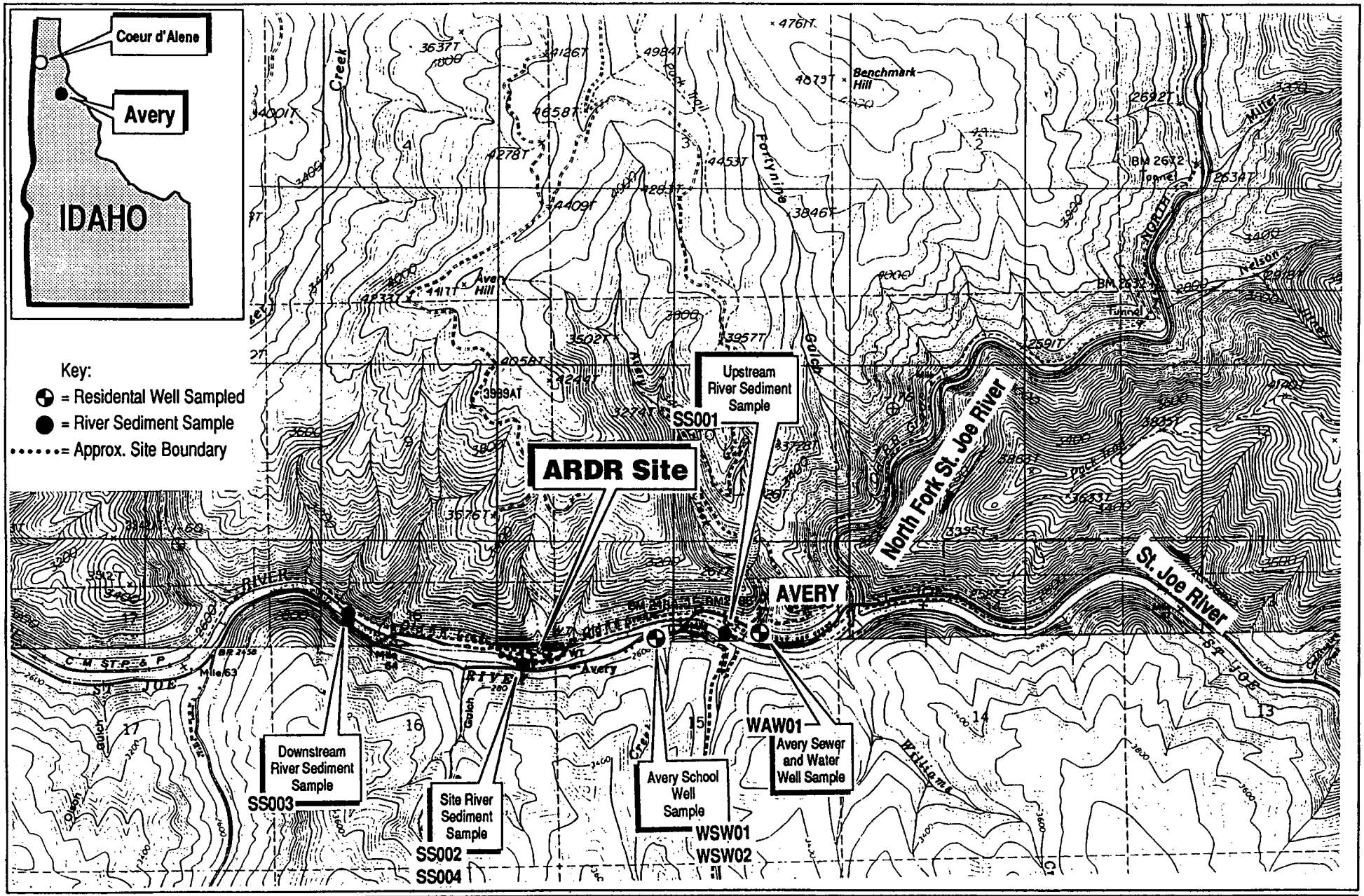
Sample Number	Sample Type	Location	Objective	Date	Time
WSW01	Groundwater	Avery elementary school well	Identify the presence of contaminants in the school water	08/26/92	0837
WSW02	Groundwater	Duplicate of WSW01	Test reliability of sampling procedures	08/26/92	0837
WAW01	Groundwater	Avery Sewer and Water well	Provide background comparison	08/26/92	0915
WHC01	Groundwater	On-site monitoring well HC-3	Identify the presence of contaminants in the groundwater below the site	08/26/92	1020
WTB01	Water	VOA trip blank collected from available de-ionized water	Identify the possible contamination of sample containers while in transit to the laboratory	08/26/92	0820
SS001	Sediment	Upstream river sediment collected approximately 1/2 mile upstream of the eastern end of the site	Provide a background comparison for the constituents in the river sediments	08/25/92	1230
SS002	Sediment	River sediment collected along the center of the site just downstream of the visible oil seep	Identify the contaminants in the river sediments	08/25/92	1100
SS003	Sediment	Downstream river sediment collected approximately 1/4 mile downstream of the oil seep	Identify the presence of contaminants downstream of the site	08/25/92	1025

Table 4-1 (Continued)
Summary of Sample Types, Numbers, and Location

Sample Number	Sample Type	Location	Objective	Date	Time
SS004	Sediment	Duplicate of the site river sediment (SSD02)	Test reliability of sampling procedures	08/25/92	1130
ORS01	Oily Sediment	Oil seep material sampled from the site riverbank	Provide information on the type of contaminants present in the oil seep	08/25/92	1200
ORS02	Oily Sediment	Duplicate of the oily seep (ORS01)	Test reliability of sampling procedure	08/25/92	1200
SS01-1	Soil	Soil sample (0-6") collected from the easternmost end of the site	Provide information on the type of contaminants present in the site fill material	08/26/92	1100
SS01-2	Soil	Soil sample (6-12") collected from the easternmost end of the site	Provide information on the type of contaminants present in the site fill material	08/26/92	1110
SS02-1	Soil	Soil sample (0-6") collected from the ground near the reported location of the 500,000-gallon fuel tank	Provide information on the type of contaminants present	08/26/92	1135
SS02-2	Soil	Soil sample (6-12") collected from the ground near the reported location of the 500,000-gallon fuel tank	Provide information on the type of contaminants present	08/26/92	1135
SS03-1	Soil	Soil sample (0-6") collected from the ground near a pile of railroad ties	Provide information on the type of contaminants present	08/26/92	1145
SS03-2	Soil	Soil sample (6-12') collected from the ground near a pile of railroad ties	Provide information on the type of containments present	08/26/92	1145

Table 4-1 (Continued)
Summary of Sample Types, Numbers, and Location

Sample Number	Sample Type	Location	Objective	Date	Time
SS04-1	Soil	Soil sample (0-6″) collected from the current site road surface	Provide information on the type of contaminants present	08/26/92	1200
SS04-2	Soil	Soil sample (6-12″) collected from the current site road subsurface	Provide information on the type of contaminants present	08/26/92	1200
SS05-1	Soil	Soil sample (0-6″) collected from the ground near the location of former railroad buildings	Provide infomation on the type of contaminants present	08/26/92	1210
SS05-2	Soil	Soil sample (6-12″) collected from the ground near the location of former railroad buildings	Provide information on the type of contaminants present	08/26/92	1210
SS06-1	Soil	Soil sample (0-6″) collected from the oily seep along the riverbank	Provide information on the type of contaminants present	08/26/92	1230
SS06-2	Soil	Soil sample (6-12″) collected from the oily seep along the riverbank	Provide information on the type of contaminants present	08/26/92	1230
SS07-1	Soil	Duplicate of SS05-1	Test reliability of sampling procedures	08/26/92	1210
SS07-2	Soil	Duplicate of SS05-2	Test reliability of sampling procedures	08/26/92	1210



URS CONSULTANTS

NORTH

0 1/2 1

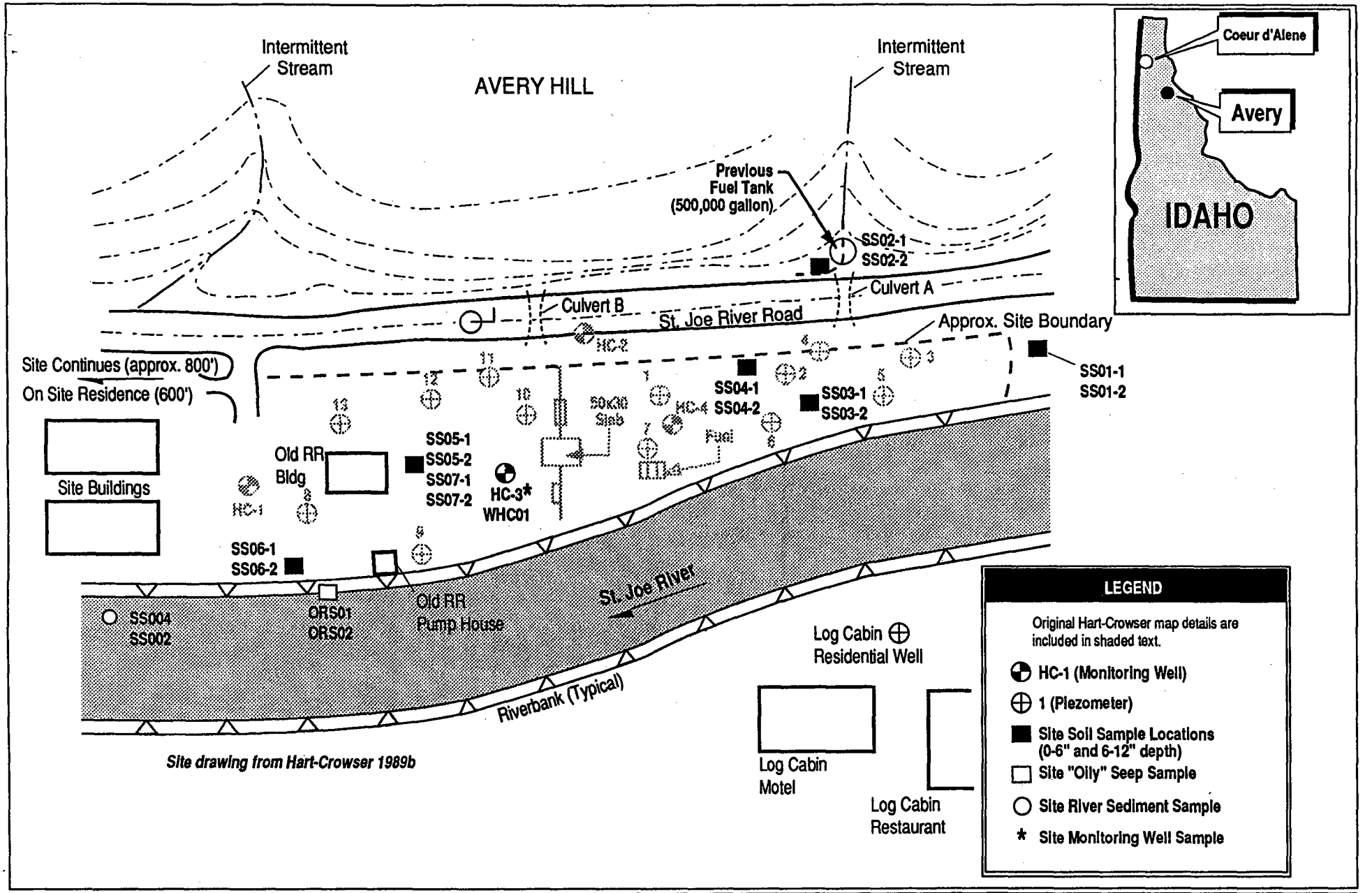
Scale In Miles

Source: U.S.G.S. Topographic Quads

Figure 4-1
Sample Location Map

Avery Railroad Dump and Roundhouse Avery, Idaho

PAL 002055



Site drawing from Hart-Crowser 1989b

PAL 002056

URS CONSULTANTS

NORTH

0 75 150

Scale In Feet

Figure 4-2
On-Site Sample Location Map

Avery Railroad Dump and Roundhouse Avery, Idaho

4.2.2 Site Monitoring Well Groundwater Samples (TSOP 5.1 and 3.6)

One on-site monitoring well water sample (WHC01) was collected from on-site well HC-3 (Figure 4-2) to characterize the groundwater below the "oily" layer floating on the perched groundwater at the site, as described in the Field Sampling Plan (URS 1992b). The well was not purged and a sample was not collected of the oily layer on the groundwater. The thickness of the oily layer was not measured. Previous sampling at this site measured a 4-foot layer of oily substance in the on-site monitoring wells (Hart-Crowser 1989a).

4.2.3 River Sediment Samples (TSOP 5.5)

River sediment samples were collected to identify the presence of contaminants in the streambed. Three locations along the St. Joe River were sampled: downstream (SS003), along the site (SS002 and SS004), and upstream (SS001) (Figures 4-1 and 4-2). These samples were collected from areas of sediment accumulation, the inside of stream meanders, and in quiet shallow areas, or low-velocity zones. The upstream river sediment sample was collected to identify background conditions. The site river sediment sample was collected just downstream of the observed oily seep (approximately 20 feet).

4.2.4 Site Soil Samples (TSOP 5.4)

As detailed in the Field Sampling Plan, on-site soil samples were collected from six locations, at two depths: zero to 6 inches and 6 to 12 inches (Figure 4-2) (URS 1992b). Sampling locations were selected based on information from the PA Report; the site plat map (Appendix A), which identifies approximate areas of former railroad operations; and from the initial site visit, which documents areas of visible staining. One soil sampling location was designated to be the on-site background soil sample (surface SS01-1, subsurface SS01-2). This sample was collected from a location on the easternmost end of the site along the river bank. This sample was intended to provide a representation of the type of contaminants that are present in the site fill materials.

Surface soil sample SS-01 and subsurface soil sample SS-02 were intended to be used as background. Reported data for these samples contain high concentrations of semivolatile compounds and the subsurface background soil sample reported a PCB concentration of 230 ppb. These data indicate that the soil samples intended as background during the planning phase of this investigation have been influenced by

activities at this site. Therefore, these samples are not appropriate for use as background. As an alternative, the least contaminated on-site soil samples, SS02-1 and SS02-2, were designated as background for site soils. These soil samples were collected from the area where the railroad fuel tank was formerly located. The results from these site soil samples were compared to the remaining on-site surface and subsurface soil samples to define the significant concentrations of particular substances. The remainder of this document will refer to SS02-1 and SS02-2 as background; SS01-1 and SS01-2 will be referred to as eastern site soil samples.

The remaining on-site soil samples were taken of discolored soils near a stack of creosote railroad ties (surface SS03-1, subsurface SS03-2); from current site roadway soil (surface SS04-1, subsurface SS04-1); next to former railroad buildings (surface SS05-1 and SS07-1, subsurface SS05-2 and SS07-2); and along the top of the riverbank (surface SS06-1, subsurface SS06-2).

4.2.5 Site Seep Samples

Two samples were collected of the oily seep (ORS01 and ORS02) that was observed leaching from the site into the river (IDEQ 1991a). The approximate location of this seep is identified in Figure 4-2.

4.3 Sample Analytical and Handling Requirements

Sample analytical requirements for the ARDR SI are summarized in Table 4-2. Included are descriptions of requested analytes, the analytical programs used, sample preservation techniques, and maximum sample holding times. Analytical methods and bottle requirements for samples collected during this investigation are described in the EPA's Users Guide to the Contract Laboratory Program (EPA 1988b). All samples were analyzed for the specified compounds and analytes detailed in the Field Sampling Plan (URS 1992b).

Analytical quality control analyses included matrix spike analyses, surrogate analyses, duplicate analyses, and method blank analyses. A summary of precision, accuracy, and completeness for this field sampling program is presented in Appendix E. All samples intended for analysis through the EPA Region 10 Laboratories were handled and documented in accordance with procedures specified in EPA's Users Guide to the Contract Laboratory Program (EPA 1988b) and National Enforcement Investigations

Table 4-2
Sample Analytical Requirements

Sample Matrix	Number of Samples Collected	Sample Location	Analytical Requirements	Analytical Program	Preservation Technique	Maximum Holding Times
Groundwater	2	See Figures 4-1 and 4-2	VOCs BNAs Pesticide/PCBs Total Metals	EPA Manchester EPA Manchester EPA Manchester EPA Manchester	HCl, Ice Ice Ice HNO_3, Ice	14 days 7 days 7 days 6 months/28 days for mercury
	1	Background	VOCs BNAs Pesticide/PCBs Total Metals	EPA Manchester EPA Manchester EPA Manchester EPA Manchester	HCl, Ice Ice Ice HNO_3, Ice	14 days 7 days 7 days 6 months/28 days for mercury
	2	Quality Control (Trip blank and 1 duplicate)	VOCs BNAs Pesticide/PCBs Total Metals	EPA Manchester EPA Manchester EPA Manchester EPA Manchester	HCl, Ice Ice Ice HNO_3, Ice	14 days 7 days 7 days 6 months/28 days for mercury
Soil/Sediment	13	See Figures 4-1 and 4-2	VOCs BNAs Pesticide/PCBs Total Metals	EPA Manchester EPA Manchester EPA Manchester EPA Manchester	Ice Ice Ice Ice	14 days 7 days 7 days 6 months/28 days for mercury
	3	Background for surface soil, subsurface soil, and river sediments	VOCs BNAs Pesticide/PCBs Total Metals	EPA Manchester EPA Manchester EPA Manchester EPA Manchester	Ice Ice Ice Ice	14 days 7 days 7 days 6 months/28 days for mercury
	4	Quality Control (4 duplicates)	VOCs BNAs Pesticide/PCBs Total Metals	EPA Manchester EPA Manchester EPA Manchester EPA Manchester	Ice Ice Ice Ice	14 days 7 days 7 days 6 months/28 days for mercury

Source: URS 1992b

Center Policies and Procedures (EPA 1985). Specific chain-of-custody procedures were followed in accordance with EPA Region 10 requirements. Sample packaging conformed with applicable Department of Transportation Regulations (49 CFR 171-177) and International Air Transport Association guidelines (IATA 1987). All samples were shipped via an overnight delivery service to the laboratory for analysis within 48 hours of collection.

Samples collected from the site oily seep were anticipated to require dilution in order to identify the lower limit concentrations of contaminants. It was important for this project to identify the presence of higher concentration contaminants at levels that were not estimates due to high dilution. Therefore, the samples were requested to be analyzed to accurately identify the higher concentration contaminants. Laboratory Special Analytical Services protocol for the oily sample was included in the sampling plan (URS 1992b).

5.0 SAMPLE RESULTS AND DISCUSSION

All samples collected during this investigation were analyzed for volatile organic, semivolatile organic, pesticide and polychlorinated biphenyl (PCB) compounds, and total metal analytes as specified in the Field Sampling Plan for the Avery Railroad Dump and Roundhouse (URS 1992b).

A summary of the data quality objectives for this site is presented in Appendix E. The laboratory data reports and corresponding data validation reports are provided in Appendix F. Photographic documentation of the site visit and field sampling at the ARDR site is provided in Appendix G.

During the data evaluation process, the conditions used to define an "observed release" of a particular substance to any of the matrices sampled are summarized in Table 5-1. The discussions of site data in Sections 5-2 through 5-5 use the term "significant" based on the criteria described in Table 5-1.

Based on EPA Region 10 policy, aluminum, calcium, iron, magnesium, potassium, sodium, and zinc (common earth crust elements) are generally used only in water mass tracing, which is beyond the scope of this report. Although these elements are included in the tables, the data are not evaluated against the criteria in Table 5-1.

5.1 GROUNDWATER

Groundwater results are provided in Table 5-2.

Residential groundwater sample WAW01 is designated as background and was collected approximately 0.75 mile east of the ARDR site. The background designation was due to its location upgradient of the suspected direction of regional groundwater flow. This sample (WAW01) was used for comparison to the school well (WSW01 and WSW02) and the on-site monitoring well (WHC01).

The use of a drinking water supply well (WAW01) for comparison to the on-site monitoring well (WHC01) is not technically appropriate. The drinking water well is constructed differently, draws water from a lower aquifer, and is regularly pumped. The

Table 5-1
Significance Criteria for Chemical Analysis

Sample Measurement < Sample Quantitation Limit[a]
No observed release is established; the result is not identified as "significant."
Sample Measurement > Sample Quantitation Limit[a]
An observed release or "significant" result is established as follows:
If the background concentration is not detected (or is less than the detection limit), an observed release or significant result is established when the sample measurement equals or exceeds the sample quantitation limit[a].
If the background concentration equals or exceeds the detection limit, an observed release or significant result is established when the sample measurement is three times or more above the background concentration.

[a]If the SQL cannot be established, determine if there is an observed release as follows:

- If the sample analysis was performed under the EPA CLP, use EPA CRQL in place of the SQL.
- If the sample analysis is not performed under the EPA CLP, use the detection limit in place of the SQL.

Source: 40 CFR, Part 300, Hazard Ranking System Final Rule, 1990

Table 5-2
Water Sample Results, Avery, Idaho
August 26, 1992

Substance Detected (µg/L)	Avery Sewer and Water Well - Off-Site Background		Avery Elementary School Well - Off Site		Avery Elementary School Well - Off Site (duplicate)		On-Site Montoring Well (HC-3)		Safe Drinking Water Act Standard	
	WAW01	Qualifier	WSW01	Qualifier	WSW02	Qualifier	WHC01	Qualifier	MCL	Footnote
Volatile Organics										
Benzene	1	U	1	U	1	U	20		5	F
Naphthalene	1	U	1	U	1	U	87			NS
Semivolatile Organics										
Acenaphthene	2	U	2	U	2	U	54			NS
Phenanthrene	2	U	2	U	2	U	230			NS
Fluorene	2	U	2	U	2	U	150			NS
Naphthalene, 1-Methyl-	2	U	2	U	2	U	840			NS
2-Methylnaphthalene	2	U	2	U	2	U	630			NS
Pyrene	2	U	2	U	2	U	19	J		NS
Fluoranthene	2	U	2	U	2	U	15	J		NS
Metals										
Calcium	30,200		37,600		37,600		63,500			NS
Magnesium	6,370		7,700		7,720		30,200			NS
Sodium	4,700		4,220		4,180		14,800			NS
Potassium	1,800	U	2,200	U	2,210	U	8,460			NS

Table 5-2 (Continued)
Water Sample Results, Avery, Idaho
August 26, 1992

Substance Detected (µg/L)	Avery Sewer and Water Well - Off-Site Background		Avery Elementary School Well - Off Site		Avery Elementary School Well - Off Site (duplicate)		On-Site Montoring Well (HC-3)		Safe Drinking Water Act Standard	
	WAW01	Qualifier	WSW01	Qualifier	WSW02	Qualifier	WHC01	Qualifier	MCL	Footnote
Arsenic	1.7	J	4.7	J	4.7	J	102	J	50	*
Barium	12.7		10.7		10.9		272		2,000	F
Beryllium	1.0	U	1.0	U	1.0	U	2.2	J	4	#
Cadmium	2.0	U	2.0	U	2.0	U	3	J	5	F
Chromium	5.1	U	5.0	U	5.0	U	29.2		100	F
Cobalt	3.1	U	3.0	U	3.0	U	49.1			NS
Copper	5.5	J	4	J	3.0	U	171		1,300	AL
Lead	1.2	J	1.2	J	1.4	J	54.4		15	AL
Manganese	1.7	J	1.0	U	1.0	U	4,020			NS
Nickel	1.0	U	1.0	U	10	U	69	J	100	F
Silver	3.1	U	3.0	U	3.0	U	13.6			NS
Vanadium	2.0	U	2.0	U	2.0	U	66.7			LR
Zinc	7.2	UJ	82.9		85.7		717			LR
Aluminum	61	UJ	65	UJ	67	UJ	27,600			LR
Iron	12	J	13	J	13	J	74,200			NS

Table 5-2 (Continued)
Water Sample Results, Avery, Idaho
August 26, 1992

Substance Detected (µg/L)	Avery Sewer and Water Well - Off-Site Background		Avery Elementary School Well - Off Site		Avery Elementary School Well - Off Site (duplicate)		On-Site Montoring Well (HC-3)		Safe Drinking Water Act Standard	
	WAW01	Qualifier	WSW01	Qualifier	WSW02	Qualifier	WHC01	Qualifier	MCL	Footnote
Pesticides/PCB										
None detected										

Qualifiers:
J - The value is an estimate
U - Analyte or compound was not detected at or above the shown value
UJ - Analyte or compound was not detected at or above the shown value; the shown value is an estimate of the sample quantitation limit for this analyte or compound

Notes:
MCL - Maximum contaminant level
Highlighted data represent significantly elevated concentration (Table 5-1 criteria)

Footnotes:
* - Under review
# - Beryllium MCL effective January 1994
AL - Action level
F - Final
LR - Listed for regulation
NS - No standard under this regulation

62760\9301.037\table.5-2

monitoring well on the ARDR site (WCH01) is not constructed as a drinking water well, is developed in the shallow aquifer, and usually remains stagnant. A more appropriate comparison for the on-site monitoring well would be another monitoring well in the shallow aquifer located upgradient of the ARDR site. No other monitoring wells were available in the Avery area.

Additionally, the Safe Drinking Water Act maximum contaminant limit (MCL), provided in the last column of Table 5-2, is not applicable to the monitoring well sample (WHC01). MCLs are for comparison to drinking water wells only.

5.1.1 Volatile Organics

As indicated in Table 5-2, no volatile organic compounds (VOCs) were detected in the background well sample (WAW01). The VOC water sample results for WAW01 were not estimated.

No VOCs were reported in the Avery school well samples WSW01 and WSW02. Two VOCs were detected in the sample collected from the on-site monitoring well (WHC01). These data were reported at concentrations determined to be significant. These VOCs were benzene at 20 μg/L and naphthalene at 87 μg/L. These results were not estimated.

5.1.2 Semivolatile Organics

No semivolatile organic compounds were detected in the background well sample (WAW01). None of these values were estimated.

No semivolatile organic compounds were reported in the Avery school well samples (WSW01 and WSW02). Seven semivolatile organic compounds were reported in the on-site monitoring well sample (WHC01). Five of these compounds qualify as significant concentrations: acenaphthene at 54 μg/L, phenanthrene at 230 μg/L, fluorene at 150 μg/L, 1-methyl naphthalene at 840 μg/L, and 2-methyl naphthalene at 630 μg/L. These are polycyclic aromatic hydrocarbons (PAHs), which are derivatives of coal, oil, and gasoline. Two other semivolatile compounds were reported at qualified concentrations in sample WHC01 but not at significant concentrations. The basis for the qualification of the two nonsignificant semivolatile compounds is unknown.

5.1.3 Total Metals

Background levels for total metals are provided by sample WAW01. Reported concentrations of arsenic, copper, lead, manganese, and iron in sample WAW01 are estimated (unknown bias).

No analytes were reported at significant concentrations in the Avery school well samples (WSW01 and WSW02). Nineteen analytes were detected in on-site sample WHC01. Four of those 19 analytes, arsenic, cadmium, chromium, and nickel, were reported at estimated (unknown bias) concentrations. Of those 19 analytes, 10 are at significant concentrations: arsenic at 102 μg/L, barium at 272 μg/L, chromium at 29.2 μg/L, cobalt at 49.1 μg/L, copper at 171 μg/L, lead at 54.4 μg/L, manganese at 4,020 μg/L, nickel at 69 μg/L, silver at 13.6 μg/L, and vanadium at 66.7 μg/L.

5.1.4 Pesticides/PCBs

No pesticide or PCB compounds were reported at detected concentrations in collected water samples.

5.2 SEDIMENT

Sediment sample results are provided in Table 5-3.

The upstream river sediment sample (SS001) is designated as background and was collected approximately 0.7 mile east of the ARDR site. This background sample was compared to other sediment samples, including the oily seep sediment samples (ORS01 and ORS02), to define significant concentrations.

5.2.1 Volatile Organics

No VOCs were reported in the background river sediment sample (SS001). The reported results for acetone and p-isopropyltoluene were estimated (unknown bias).

All reported concentrations of VOCs in sediment samples (other than background) were estimated (unknown bias). Seven VOCs were detected in the sediment samples collected at the ARDR site. None of these seven VOCs were reported at concentrations that are significant.

Table 5-3
Sediment Sample Results, Avery, Idaho
August 25, 1992

Substance Detected	Upstream River Sediment - Background		Along Site River Sediment		Downstream River Sediment		Along Site River Sediment Duplicate		Oily Seep Sediment		Oily Seep Sediment Duplicate	
	SS001	Qualifier	SS002	Qualifier	SS003	Qualifier	SS004	Qualifier	ORS01	Qualifier	ORS02	Qualifier
Volatile Organics (µg/kg)												
Acetone	10	UJ	38	U	11	UJ	110	J	330	U	600	U
Methylene chloride	12	U	11	U	11	U	12	U	110	U	17	J
2-Butanone	3	U	7	U	11	U	8	J	560	U	600	U
p-Isopropyltoluene	2	UJ	7	J	2	U	2	UJ	110	U	120	U
Toluene	2	U	0.2	J	2	U	2	U	110	U	120	U
Chlorobenzene	2	U	2	U	2	U	0.6	J	110	U	120	U
Total xylenes	2	U	2	UJ	2	U	2	UJ	7	J	4	J
Semivolatile Organics (µg/kg)												
Benzo(a)pyrene	13	J	630	U	130	U	1,000	U	1,700	J	700	J
Benzo(a)anthracene	31	J	630	U	17	J	80	J	3,400	J	5,500	J
Isophorone	27	J	110	J	7	J	1,000	U	5,400	U	5,300	U
Acenaphthene	140	U	630	U	130	U	1,000	U	13,000	J	4,000	J
Di-n-butylphthalate	230	U	630	U	130	U	1,000	U	590	J	5,300	UJ
Phenanthrene	49	J	180	J	9	J	310	J	14,000	J	5,300	UJ
Butylbenzylphthalate	140	U	1,600	U	130	U	2,600	U	14,000	UJ	520	J
N-Nitrosodiphenylamine	24	J	86	J	1,600	UJ	2,900	J	71,000	UJ	70,000	UJ
Fluorene	140	U	630	U	130	U	1,000	U	22,000	J	5,300	U
Carbazole	68	J	29	J	640	UJ	5,200	UJ	28,000	UJ	28,000	UJ
Naphthalene, 1-Methyl-	4	J	84	J	130	U	1,000	U	10,000	J	8,400	
2-Methylnaphthalene	6	J	63	J	130	U	89	J	2,700	J	2,700	J

Table 5-3 (Continued)
Sediment Sample Results, Avery, Idaho
August 25, 1992

Substance Detected	Upstream River Sediment - Background		Along Site River Sediment		Downstream River Sediment		Along Site River Sediment Duplicate		Oily Seep Sediment		Oily Seep Sediment Duplicate	
	SS001	Qualifier	SS002	Qualifier	SS003	Qualifier	SS004	Qualifier	ORS01	Qualifier	ORS02	Qualifier
Benzyl alcohol	710	U	1,500	J	640	U	5,200	UJ	28,000	UJ	28,000	UJ
bis(2-Ethylhexyl) phthalate	8,600	J	950	U	980	U	20,000		1,300	J	5,300	U
Di-n-octyl phthalate	140	U	630	U	130	U	1,000	U	5,400	U	420	J
Anthracene	140	U	180	J	130	U	1,000	U	5,400	U	5,300	UJ
Pyrene	64	J	280	J	8	J	630	J	15,000	J	10,000	J
Benzo(g,h,i)perylene	140	U	630	U	130	U	1,000	U	5,400	UJ	1,200	J
Benzo(b)fluoranthene	16	J	630	U	130	U	1,000	U	4,100	J	2,200	J
Fluoranthene	23	J	630	U	6	J	190	J	6,000	J	5,300	UJ
Chrysene	85	J	630	U	12	J	610	J	6,200		4,900	J
Retene	140	U	240	J	130	U	1,000	U	13,000	J	5,300	U
Total Metals (mg/kg)												
Selenium	0.20	U	0.20	U	0.20	U	0.20	U	0.2	U	0.21	J
Mercury	0.02	UJ	0.02	UJ	0.02	UJ	0.023	J	0.2	UJ	0.046	J
Calcium	1,160		1,340		1,470		1,800		1,200	J	1,300	
Magnesium	45.3		4,150		3,590		4,010		2,870		3,130	
Potassium	812		916		849		792		649		816	
Arsenic	23		17.2		11	J	24.1		11	J	11	J
Barium	27.6		33.8	J	31.3		36.7		31.1		30.7	
Beryllium	0.29	J	0.34	J	0.26	J	0.35	J	0.36	J	0.38	J
Cadmium	0.28	J	0.20	U	0.20	U	0.38	J	0.20	U	0.56	J
Chromium	7.22		7.46		6.39		8.62		6.24		6.18	

Table 5-3 (Continued)
Sediment Sample Results, Avery, Idaho
August 25, 1992

Substance Detected	Upstream River Sediment - Background		Along Site River Sediment		Downstream River Sediment		Along Site River Sediment Duplicate		Oily Seep Sediment		Oily Seep Sediment Duplicate	
	SS001	Qualifier	SS002	Qualifier	SS003	Qualifier	SS004	Qualifier	ORS01	Qualifier	ORS02	Qualifier
Cobalt	9.6		5.95		6.08		6.03		4.3		4.11	
Copper	27.5	J	42		17		107		121		82	J
Lead	25.4		36.5		9.2	J	165		37.3		20.6	
Manganese	203		167		264		164		112		94.2	
Nickel	12.7		12		8.45		15.2		14.4		15.3	
Silver	3.33	J	3.02	J	2.5	J	3.36	J	1.78		2.13	
Vanadium	14.8		18.4	J	11.5		25.5		23.6		23	
Zinc	47.9		52.1	J	40.2		63.9		47.3	J	87.2	
Aluminum	7,380		6,440		5,840		6,340		4,680		5,520	
Iron	18,800		16,300		13,200		17,900		10,300		12,000	
Pesticides/PCB (µg/kg)												
Aroclor-1260	57	U	320		52	U	260		760		890	

Qualifiers:
U - Analyte or compound was not detected at or about the shown value
UJ - Analyte or compound was not detected at or above the shown value; the shown value is an estimate of the sample quantitation limit for this analyte or compound
J - The value is an estimate

Note:
Highlighted data represent significantly elevated concentrations (Table 5-1)

5.2.2 Semivolatile Organics

Thirteen semivolatile organic compounds were reported in the upstream river sediment sample (SS001). The bias of the estimated sample results is unknown.

Twenty-two semivolatile organic compounds were reported in sediment samples collected at the ARDR site. Of these 22 compounds, 17 were reported at significant concentrations. Thirteen of these 17 significant compounds detected in site river sediments are classified as PAHs.

No significant concentrations of semivolatile organic compounds were reported in the downstream sediment sample (SS003). Only one compound, benzyl alcohol, was reported at a significant concentration in the site river sediment sample (1,500 μg/kg in sample SS002). Only n-nitrosodiphenylamine was reported in the site river sediment duplicate sample at a significant concentration (2,900 μg/kg in sample SS003). These data were estimated (unknown bias).

The remaining 15 semivolatile organic compounds detected at significant concentrations were reported in samples collected of the site oily seep sediment. Thirteen of the compounds reported in the oily seep sediment sample were PAHs. The PAH compounds reported in sample ORS01 (reported as nonsignificant or nondetects in sample ORS02) at significant concentrations included phenanthrene at 14,000 μg/kg, fluorene at 22,000 μg/kg, fluoranthene at 6,000 μg/kg, and retene at 13,000 μg/kg. Semivolatile compounds reported in duplicate sample ORS02 (reported as nonsignificant or nondetects in sample ORS01) were butylbenzylphthalate at 520 μg/kg, di-n-octyl phthalate at 420 μg/kg, and benzo(g,h,i)perylene (PAH) at 1,200 μg/kg. The following PAH compounds were reported in both samples ORS01 and ORS02 at significant concentrations, respectively: benzo(a)pyrene at 1,700 μg/kg and 700 μg/kg, benzo(a)anthracene at 3,400 μg/kg and 5,500 μg/kg, acenaphthene at 13,000 μg/kg and 4,000 μg/kg, 1-methyl naphthalene at 10,000 μg/kg and 8,400 μg/kg, 2-methyl naphthalene at 2,700 μg/kg in both samples, pyrene at 15,000 μg/kg and 10,000 μg/kg, benzo(b)fluoranthene at 4,100 μg/kg and 2,200 μg/kg, and chrysene at 6,200 μg/kg and 4,900 μg/kg. All of these sample results were estimated (unknown bias). Calibration discrepancies, indicating low bias, were the basis for qualification of data for butylbenzylphthalate, bis(2-ethylhexyl)phthalate, di-n-octyl phthalate, and benzo(g,h,i)perylene.

5.2.3 Total Metals

Background levels for total metals are provided by sample WAW01. Reported concentrations of arsenic, copper, lead, manganese, and iron in sample WAW01 are estimated (unknown bias).

No analytes were reported at significant concentrations in the Avery school well samples (WSW01 and WSW02). Nineteen analytes were detected in on-site sample WHC01. Four of those 19 analytes, arsenic, cadmium, chromium, and nickel, were reported at estimated (unknown bias) concentrations. Of those 19 analytes, 10 are at significant concentrations: arsenic at 102 μg/L, barium at 272 μg/L, chromium at 29.2 μg/L, cobalt at 49.1 μg/L, copper at 171 μg/L, lead at 54.4 μg/L, manganese at 4,020 μg/L, nickel at 69 μg/L, silver at 13.6 μg/L, and vanadium at 66.7 μg/L.

5.2.4 Pesticide/PCBs

No pesticide compounds were detected in any sediment samples collected at the ARDR site.

The PCB compound Aroclor-1260 was reported as not detected in the upstream (background SS001) and downstream (SS003) sediment samples. The reported nondetect values in these samples were not estimated.

Aroclor-1260 was reported in the site river sediment samples (SS002 and SS004) at concentrations of 320 μg/kg and 260 μg/kg. Aroclor-1260 was also reported in the oily seep sediment samples (ORS01 and ORS02) at concentrations of 760 μg/kg and 890 μg/kg. None of these values were estimated.

5.3 SURFACE SOIL

Surface soil sample (from 0 to 6 inches below the ground surface) results are provided in Table 5-4.

Surface soil sample SS02-1 was designated as background for comparison purposes. This sample was collected of the site fill material and was used to evaluate significant concentrations of site surface soil samples. A site soil sample was used as background to characterize the fill material at the ARDR site, which may not be native to the area.

Table 5-4
Surface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-1	Qualifier	SS01-1	Qualifier	SS03-1	Qualifier	SS04-1	Qualifier	SS05-1	Qualifier	SS06-1	Qualifier	SS07-1	Qualifier
Volatile Organics (µg/kg)														
1,1,1-Trichloroethane	3	UJ	4	U	200	UJ	3	UJ	3	UJ	3	UJ	0.6	J
Carbon disulfide	17	U	18	U	1,000	U	16	U	15	U	15	U	0.1	J
1,1-Dichloroethene	3	U	4	U	200	U	3	U	3	U	3	U	0.4	J
Trichlorofluoromethane	0.5	J	4	U	200	UJ	3	UJ	0.4	J	3	UJ	3	UJ
Methane, Dichlorodifluoro-	23	J	8	J	1,000	U	16	UJ	16	J	0.4	J	76	J
Ethene, Trichloro-	3	U	4	U	200	U	3	U	3	U	3	U	0.1	J
Naphthalene	4		4	UJ	1,200		3	U	3	U	3	UJ	3	U
1,2,4-Trimethylbenzene	1	J	4	UJ	1,300		3	U	3	U	3	UJ	3	U
Ethylbenzene	3	U	4	U	13	J	3	U	3	U	3	U	3	U
1,3,5-Trimethylbenzene	0.7	J	4	UJ	1,800	J	3	UJ	3	U	3	UJ	3	UJ
Toluene	3	U	4	U	15	J	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	3	U	4	U	200	U	3	U	3	U	3	U	0.5	J
Benzene, 1-Bromo-4-fluoro-	NAF		NAF		NAF		NAF		87		NAF		NAF	
Total xylenes	0.09	J	4	UJ	400		3	U	NAF		3	UJ	NAF	
Semivolatile Organics (µg/kg)														
Benzo(a)pyrene	480	U	110	J	440	J	680	U	100	U	120	UJ	120	U
Benzo(a)anthracene	100	J	140	J	3,000		680	U	100	U	120	U	120	U
Isophorone	480	U	490	U	830	U	13	J	340	J	83	J	5	J
Acenaphthene	26	J	34	J	2,700	J	680	U	100	U	120	U	120	U

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Table 5-4 (Continued)
Surface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-1	Qualifier	SS01-1	Qualifier	SS03-1	Qualifier	SS04-1	Qualifier	SS05-1	Qualifier	SS06-1	Qualifier	SS07-1	Qualifier
Phenanthrene	160	J	510		14,000		220	J	120		18	J	65	J
Butylbenzylphthalate	41	J	1,300	U	210	U	1,700	U	260	U	310	U	310	U
N-Nitrosodiphenylamine	6,200	UJ	74	J	11,000	UJ	27	J	1,400	UJ	1,600	UJ	1,500	UJ
Fluorene	480	U	31	J	3,000		680	U	100	U	120	U	120	U
Naphthalene, 1-Methyl-	66	J	140	J	26,000		150	J	40	J	14	J	17	J
Naphthalene	22	J	170	J	2,700	J	93	J	110		18	J	45	J
2-Methylnaphthalene	32	J	160	J	15,000		150	J	48	J	15	J	22	J
bis(2-Chloroethyl) ether	480	U	68	J	830	U	680	U	100	U	120	U	120	U
Anthracene	26	J	93	J	120	J	38	J	13	J	120	U	9	J
Pyrene	240	J	460	J	7,000		110	J	25	J	6	J	43	J
Dibenzofuran	480	U	160	J	830	U	62	J	50	J	11	J	21	J
Benzo(g,h,i)perylene	480	U	240	J	830	U	680	U	100	U	120	UJ	66	J
Indeno(1,2,3-cd)pyrene	480	U	160	J	190	J	680	U	100	U	120	UJ	52	J
Benzo(b)fluoranthene	110	J	430	J	1,000	J	680	U	39	J	120	UJ	79	J
Fluoranthene	110	J	430	J	5,700	J	120	J	67	J	120	U	45	J
Benzo(k)fluoranthene	480	UJ	130	J	830	U	680	UJ	100	UJ	120	UJ	120	UJ
Acenaphthylene	480	U	16	J	30	J	680	U	100	U	120	U	120	U
Chrysene	160	J	440	J	3,300		680	U	40	J	120	U	120	U
Retene	480	U	240	J	830	U	140	J	78	J	120	U	28	J

Table 5-4 (Continued)
Surface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-1	Qualifier	SS01-1	Qualifier	SS03-1	Qualifier	SS04-1	Qualifier	SS05-1	Qualifier	SS06-1	Qualifier	SS07-1	Qualifier
Total Metals (mg/kg)														
Mercury	0.02	UJ	0.065	J	0.02	UJ	0.021	J	0.02	UJ	0.02	UJ	0.02	UJ
Calcium	2,910		4,220		2,520		4,920		2,970		10,800	J	3,060	
Magnesium	12,600		2,720		2,680		4,680		5,890		11,000	J	6,180	
Potassium	2,740		948		601		1,710		2,810		4,800		2,870	
Arsenic	36.4		18.5		9.6	J	21.1		29.7		39.6		44.5	
Barium	76.3		145		68.7		91.9		98.4		83.3		98.6	
Beryllium	0.836		0.46	J	0.28	J	0.42	J	0.56		0.795		0.599	
Cadmium	0.32	J	1.58		0.71	J	1.5	J	0.35	J	0.58	J	0.29	J
Chromium	13.2		16.1		10.6		15.3		10.5		15.7		10.8	
Cobalt	8.92		5.97		4.9		8.22		10.2		9.99		10.2	
Copper	17.8		180		76.6		56		34.4		38.3		31.6	
Lead	394		235		87.5		60.6		29.2		61.6		24.8	
Manganese	653		326		163		322		491		575	J	491	
Nickel	15.1		16.6		15.1		13.8		16		16.3		15.3	
Silver	4.33		5.02	J	2.25	J	3.28		4.4	J	3.39		4.31	
Vanadium	19.8		21.5		18.8		16.2		18.2		17.8	J	18.1	
Zinc	24.6		187		100		196		50		75.4	J	50.3	
Aluminum	14,700		5,500		5,060		7,710		12,700		13,000		12,600	
Iron	22,900		20,200		12,500		17,600		24,000		18,200		23,800	

Table 5-4 (Continued)
Surface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-1	Qualifier	SS01-1	Qualifier	SS03-1	Qualifier	SS04-1	Qualifier	SS05-1	Qualifier	SS06-1	Qualifier	SS07-1	Qualifier
Pesticides/PCB (µg/kg)														
Aroclor-1260	49	U	390		350		410		43	U	50	U	48	U

Qualifiers:
J - The value is an estimate,
U - Analyte or compound was not detected at or about the shown value
UJ - Analyte or compound was not detected at or above the shown value; the shown value is an estimate of the sample quantitation limit for this analyte or compound

Notes:
NAF - Not analyzed for
Highlighted data indicate significantly elevated concentrations

5.3.1 Volatile Organics

Six VOCs were detected in the on-site background sample (SS02-1). The reported concentrations of VOCs in the background sample were estimated (unknown bias) for five compounds.

Fourteen VOCs were reported in the on-site surface soil samples; five of these VOCs were detected at significant concentrations in one on-site sample. Four of these significant levels were reported in the sample collected near the pile of creosote logs (SS03-1): naphthalene at 1,200 μg/kg, 1,2,4-trimethylbenzene at 1,300 μg/kg, 1,3,5-trimethylbenzene at 1,800 μg/kg, and total xylenes at 400 μg/kg. Only the reported concentration for 1,3,5-trimethylbenzene was estimated (unknown bias). The fifth VOC, 1-bromo-4-fluorobenzene, was reported only in sample SS05-1 (87 μg/kg). This compound was not reported in other surface soil samples, including background, collected at this site.

5.3.2 Semivolatile Organics

Twenty-three semivolatile organic compounds were reported in the surface soil samples collected at the ARDR site. Of these compounds, 12 were detected in the background sample (SS02-1). All of these concentrations were estimated (unknown bias).

Of the 23 semivolatile organic compounds reported in the on-site surface soil samples, 10 were detected at significant concentrations. All of these compounds are PAHs and were reported in the sample collected near the pile of creosote logs (SS03-1). The significant compounds detected in sample SS03-1 were benzo(a)anthracene at 3,000 μg/kg, acenaphthene at 2,700 μg/kg, phenanthrene at 14,000 μg/kg, fluorene at 3,000 μg/kg, 1-methylnaphthalene at 26,000 μg/kg, naphthalene at 2,700 μg/kg, 2-methylnaphthalene at 15,000 μg/kg, pyrene at 7,000 μg/kg, fluoranthene at 5,700 μg/kg and chrysene at 3,300 μg/kg. Additionally, naphthalene was reported at the significant concentration of 110 μg/kg in the sample collected near the old railroad buildings (SS05-1) and 2-methylnaphthalene was reported at the significant concentration of 160 μg/kg in the sample collected from the east end of the site (SS01-1). Estimated (unknown bias) on-site samples included acenaphthene in sample SS03-1, naphthalene in sample SS03-1, 2-methylnaphthalene in sample SS01-1, and fluoranthene in sample SS03-1.

5.3.3 Total Metals

Nineteen inorganic analytes were reported in the on-site surface soil samples. Eighteen of these analytes were detected in the background sample (SS02-1). Two of the inorganic analytes were estimated (bias unknown), mercury at the nondetect value of 0.02 mg/kg and cadmium at the concentration of 0.32 mg/kg.

Of the 19 analytes reported in the on-site surface soil samples, only copper was detected at significant concentrations. Copper was reported at the concentrations of 56 mg/kg in the sample collected from the site road surface (SS04-1), 76.6 mg/kg in the sample collected near the pile of creosote logs (SS03-1), and 180 mg/kg in the east site soil sample (SS01-1).

5.3.4 Pesticides/PCBs

No pesticides were reported in the on-site surface soil samples collected from the ARDR site.

No PCBs were detected in the background sample (SS02-1). Aroclor-1260 was reported as a nondetect in sample SS02-1.

Aroclor-1260 was detected at significant concentrations in three on-site surface soil samples: 360 μg/kg in SS01-1 (east site soil), 350 μg/kg in SS03-1 (near the pile of creosote logs), and 410 μg/kg in SS04-1 (site road surface). None of these reported values were estimated.

5.4 SUBSURFACE SOIL

Subsurface soil sample (18 to 24 inches below the ground surface) results are provided in Table 5-5.

Subsurface soil sample SS02-2 was designated as background for comparison purposes. This sample was collected from the site fill material and was used to evaluate significant concentrations of site subsurface soil samples. A site subsurface soil sample was used as background to characterize the fill material at the ARDR site, which may not be native to the area.

Table 5-5
Subsurface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-2	Qualifier	SS01-2	Qualifier	SS03-2	Qualifier	SS04-2	Qualifier	SS05-2	Qualifier	SS06-2	Qualifier	SS07-2	Qualifier
Volatile Organics (µg/kg)														
1,1,1-Trichloroethane	3	UJ	3	UJ	350	UJ	3	UJ	3	UJ	0.6	J	1	J
Methylene chloride	3	J	16	U	1,700	U	14	U	3	U	16	U	16	U
1,1-Dichloroethene	0.1	J	3	U	350	U	3	U	3	UJ	3	U	3	U
Trichlorofluoromethane	0.7	J	3	U	350	UJ	3	UJ	0.7	J	3	UJ	3	UJ
Methane, Dichlorodifluoro-	41	UJ	14	J	1,700	UJ	3	UJ	14	J	3	UJ	16	UJ
1,2,3-Trichlorobenzene	3	U	3	UJ	350	U	3	U	3	UJ	4	J	3	UJ
Naphthalene	1	J	3	UJ	6,400		3	U	3	UJ	3	UJ	2	J
1,2,4-Trimethylbenzene	3	U	3	UJ	5,900		3	U	3	UJ	3	UJ	3	UJ
1,2-Dibromo-3-chloro-propene	16	U	16	UJ	1,700	U	14	U	14	UJ	16		16	UJ
p-Isopropyltoluene	3	U	3	UJ	1,500		3	U	3	UJ	3	UJ	3	UJ
Ethylbenzene	3	U	3	UJ	65	J	3	U	3	U	3	U	3	UJ
Benzene, propyl-	3	U	3	UJ	110	J	3	U	3	UJ	3	UJ	3	UJ
1,3,5-Trimethylbenzene	3	UJ	3	UJ	5,000	J	3	U	3	U	3	UJ	3	UJ
Toluene	3	U	0.5	J	49	J	3	U	3	U	3	U	3	UJ
1,2,4-Trichlorobenzene	3	U	3	UJ	350	U	3	U	3	UJ	8	J	3	UJ
Total xylenes	3	U	3	UJ	1,620		3	U	NAF		3	UJ	3	UJ

Table 5-5 (Continued)
Subsurface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-2	Qualifier	SS01-2	Qualifier	SS03-2	Qualifier	SS04-2	Qualifier	SS05-2	Qualifier	SS06-2	Qualifier	SS07-2	Qualifier
Semivolatile Organics (µg/kg)														
Benzo(a)pyrene	120	U	240	J	740	J	16	J	650		1,600		91	J
Dibenzo(a,h)anthracene	310	U	2,300	U	2,000	U	670	UJ	170	J	210	J	1,000	U
Benzo(a)anthracene	120	U	310	J	2,200		28	J	770		1,500		270	J
Isophorone	8	J	900	U	790	U	47	J	50	J	3,000		820	J
Acenaphthene	120	U	72	J	8,700	J	260	UJ	440	U	400	U	91	J
Phenanthrene	9	J	1,200		31,000		27	J	6,800		680		4,300	U
N-Nitrosodiphenylamine	17	J	12,000	UJ	10,000	UJ	3,500	UJ	92	J	5,200	UJ	84	J
Fluorene	120	U	58	J	11,000		2	J	68	J	400	U	31	J
Carbazole	630	UJ	4,600	UJ	4,100	UJ	1,400	UJ	350	J	2,100	UJ	130	J
Naphthalene, 1-Methyl-	120	U	370	J	55,000		14	J	1,900		190		1,800	
Naphthalene	120	U	300	J	6,000		11	J	5,700		190		4,400	
2-Methylnaphthalene	120	U	360	J	46,000		16	J	2,500		250		2,200	
bis(2-Ethylhexyl) phthalate	120	U	900	U	6,100	J	1,300	U	440	U	400	U	2,300	U
Anthracene	120	U	194	J	2,600	J	3	J	460	J	63	J	220	J
1,2,4-Trichlorobenzene	120	U	900	U	790	U	260	UJ	440	U	2,900		400	U
Pyrene	9	J	1,300		5,900		39	J	3,400		3,200		850	
Dibenzofuran	120	U	390	J	790	U	5	J	3,400	U	51	J	2,500	
Benzo(g,h,i)perylene	120	U	470	J	790	U	260	UJ	910		1,300		400	U
Indeno(1,2,3-cd)pyrene	120	U	260	J	790	U	16	J	930		1,100		170	J

Table 5-5 (Continued)
Subsurface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-2	Qualifier	SS01-2	Qualifier	SS03-2	Qualifier	SS04-2	Qualifier	SS05-2	Qualifier	SS06-2	Qualifier	SS07-2	Qualifier
Benzo(b)fluoranthene	120	U	610	J	470	J	43	J	2,300		1,800	J	760	
Fluoranthene	9	J	1,100	J	1,700		50	J	3,400		2,300		1,700	
Benzo(k)fluoranthene	120	U	900	U	790	UJ	20	J	580		670	J	210	J
Acenaphthylene	120	U	900	U	790	U	260	UJ	440	U	37	J	24	J
Chrysene	120	U	620	J	2,500		32	J	1,800		1,700	J	670	
Retene	120	U	870	J	790	U	37	J	1,600		450	J	1,100	
Total Metals (mg/kg)														
Selenium	0.20	UJ	0.20	U	0.20	U	0.20	UJ	0.20	U	0.45	J	0.46	J
Mercury	0.20	UJ	0.12	J	0.02	UJ	0.04	J	0.037	J	0.58	J	0.057	J
Calcium	2,070		3,250		1,460		4,420		5,400		4,510	J	8,050	J
Magnesium	5,260		2,580		2,070		6,410		3,590		3,580		3,360	
Potassium	1,370		437		240		2,490		1,150		687		933	
Arsenic	68.8		10	J	5.3	J	40.7		46.5		19.9		39.9	
Barium	42.8		148		21		137		247		298		597	
Beryllium	0.502		0.43	J	0.37	J	0.572		0.859		1.04		1.45	
Cadmium	0.33	J	0.39	J	0.33	J	0.49	J	0.58	J	0.81	J	0.51	J
Chromium	10.5		11.8		8.77		10.3		7.94		10.1		9.94	
Cobalt	9.63		4.74		4.79		9.21		8.17		9.85		8.58	
Copper	15.1		225		43.6		34.8		123		383		184	
Lead	25.8		211		31		47.8		225		533	J	292	

Table 5-5 (Continued)
Subsurface Soil Sample Results, Avery, Idaho
August 26, 1992

Substance Detected	Background		East Site Soil		Area Near Creosote Logs - Black Soil		Along Site Graded Road Surface		Along Side of Former RR Buildings		Along Top of River Embankment		Along Side of Former RR Buildings - Duplicate	
	SS02-2	Qualifier	SS01-2	Qualifier	SS03-2	Qualifier	SS04-2	Qualifier	SS05-2	Qualifier	SS06-2	Qualifier	SS07-2	Qualifier
Manganese	323		264		96		502		401		317		371	
Nickel	12.2		15.9		16.9		13.7		23.3		71.8	J	33.9	
Silver	3.67		3.53	J	1.35	J	3.6		3.17	J	3.03	J	3.62	J
Vanadium	13.3		20.4		**46.2**		15.3		33.6		**75.2**		**49.1**	
Zinc	15.9		65.8		41.9		97.8		78.4		403	J	63.7	J
Aluminum	8,420		4,180		3,880		12,500		7,390		6,940		10,200	
Iron	20,300		18,700		8,210		19,600		17,800		17,400		20,400	
Pesticides/PCB (µg/kg)														
Aroclor-1260	50	U	**230**		**170**		**150**		**370**		**86,700**		**130**	

Qualifiers:
J - The value is an estimate.
U - Analyte or compound was not detected at or about the shown value
UJ - Analyte or compound was not detected at or above the shown value; the shown value is an estimate of the sample quantitation limit for this analyte or compound

Notes:
NAF - Not analyzed for
Highlighted data indicate significantly elevated concentration

5.4.1 Volatile Organics

Sixteen VOCs were reported in the subsurface soil samples collected at this site. Four of these VOCs were detected in the background subsurface soil sample (SS02-2): methylene chloride, 1,1-dichloroethene, trichlorofluoromethane, and naphthalene. These values and some of the nondetects were estimated, bias unknown.

Of the 16 VOCs reported in the subsurface soil samples, 9 were detected at significant concentrations. Eight of these VOCs were reported in the sample collected near the pile of creosote logs (SS03-2): naphthalene at 6,400 μg/kg, 1,2,4-trimethylbenzene at 5,900 μg/kg, p-isopropyltoluene at 1,500 μg/kg, ethylbenzene at 65 μg/kg (estimated with an unknown bias), propylbenzene at 110 μg/kg (estimated with an unknown bias), 1,3,5-trimethylbenzene at 5,000 μg/kg (estimated with an unknown bias), toluene at 49 μg/kg (estimated with an unknown bias), and total xylenes at 1,620 μg/kg. The subsurface soil sample collected along the top of the river embankment (SS06-2) reported a significant concentration of 1,2-dibromo-3-chloropropene at 16 μg/kg.

5.4.2 Semivolatile Organics

Twenty-five semivolatile organic compounds were reported in the on-site subsurface soil samples. Five compounds were detected in the background sample (SS02-2) at estimated concentrations (bias unknown): isophorone, phenanthrene, n-nitrosodiphenylamine, pyrene, and fluoranthene. Only carbazole was reported as an estimated nondetect in sample SS02-2 (bias unknown). The remaining 19 semivolatile organic compounds were reported as nondetects in sample SS02-2.

Twenty-one semivolatile organic compounds were reported at significant concentrations in the subsurface soil samples collected at this site. The bias associated with estimated semivolatile data in Table 5-5 was unknown. No significant concentrations of semivolatile organics were detected in the site road surface sample (SS04-2). Only three compounds were reported at significant concentrations in the sample of the east site soil (SS01-2). Most of the significant concentrations were reported in the samples collected near the pile of creosote logs (12 compounds from sample SS03-2), along the side of the old railroad buildings (13 compounds from sample SS05-2 and 10 compounds from the duplicate sample SS07-2), and from the top of the river embankment (14 compounds from sample SS06-2).

The compounds detected in on-site soil samples included 17 PAHs: benzo(a)pyrene at 1,600 μg/kg (SS06-2), benzo(a)anthracene ranging from 770 μg/kg (SS05-2) to 2,200 μg/kg (SS03-2), acenaphthene at 8,700 μg/kg (SS03-2), phenanthrene ranging from 680 μg/kg (SS06-2) to 31,000 μg/kg (SS03-2), fluorene at 11,000 μg/kg (SS03-2), naphthalene ranging from 190 μg/kg (SS06-2) to 6,000 μg/kg (SS03-2), 1-methylnaphthalene ranging from 190 μg/kg (SS06-2) to 55,000 μg/kg (SS03-2), 2-methylnaphthalene ranging from 250 μg/kg (SS06-2) to 46,000 μg/kg (SS03-2), anthracene at 2,600 μg/kg (SS03-2), pyrene ranging from 850 μg/kg (SS07-2) to 5,900 μg/kg (SS03-2), benzo(g,h,i)perylene at 910 μg/kg (SS05-2) and 1,300 μg/kg (SS06-2), indeno(1,2,3-cd)perylene at 930 μg/kg (SS05-2) and 1,100 μg/kg (SS06-2), benzo(b)fluoranthene ranging from 760 μg/kg (SS07-2) to 2,300 μg/kg (SS05-2), fluoranthene ranging from 1,100 μg/kg (SS01-2) to 3,400 μg/kg (SS05-2), benzo(k)fluoranthene at 580 μg/kg (SS05-2), chrysene ranging from 670 μg/kg (SS07-2) to 2,500 μg/kg (SS03-2), and retene at 1,100 μg/kg (SS07-2) and 1,600 μg/kg (SS05-2).

The remaining significant concentrations of semivolatile organic compounds were isophorone at 820 μg/kg (SS07-2) and 3,000 μg/kg (SS06-2), bis(2-ethylhexyl)phthalate at 6,100 μg/kg (SS03-2), 1,2,4-trimethylbenzene at 2,900 μg/kg (SS06-2), and dibenzofuran at 2,500 μg/kg (SS07-2).

5.4.3 Total Metals

Twenty inorganic analytes were detected in the ARDR site subsurface soils. Eighteen of these analytes were reported in the background sample (SS02-2). Selenium and mercury were reported as estimated (unknown bias) nondetect in background sample SS02-2. The reported value for cadmium was also estimated (unknown bias) in the background sample (SS02-2).

Of the 20 analytes detected in the subsurface soil samples collected at the ARDR site, only barium, copper, lead, and vanadium were reported at significant concentrations. Barium was reported in site subsurface soil samples at significant concentrations ranging from 137 mg/kg (SS04-2) to 597 mg/kg (SS07-2). Copper was present at significant concentrations ranging from 123 mg/kg (SS05-2) to 383 mg/kg (SS06-2). The reported concentrations for lead in the site samples ranged from 211 mg/kg (SS01-2) to 533 mg/kg (SS06-2). The value reported in the east site soil sample (SS01-2) was estimated (unknown bias). Vanadium was detected at significant concentrations ranging from 46.2 mg/kg (SS03-2) to 75.2 mg/kg (SS06-2).

5.4.4 Pesticides/PCBs

No pesticide compounds were detected in any subsurface soil samples collected at the ARDR site.

PCB compounds were reported as not detected in the background subsurface soil sample (SS02-2). Aroclor-1260 was detected at significant concentrations in all other on-site subsurface soil samples. Aroclor-1260 concentrations ranged from 130 μg/kg (SS07-2) to 86,700 μg/kg (SS06-2). None of these values were estimated.

5.5 QUALITY CONTROL SAMPLES

Quality control samples collected during the sampling at the ARDR site included a trip blank and duplicates of groundwater, river sediment, oily seep sediment, site surface soil, and site subsurface soil. The trip blank (WBW01) results reported only dichlorodifluoromethane at the estimated (unknown bias) concentration of 0.7 μg/L. All other VOCs were reported as not detected in the blank sample (WBW01).

The duplicate groundwater samples (WSW01 and WSW02) reported similar concentrations of the same compounds and analytes (Table 5-2)

Duplicate river sediment samples (SS002 and SS004) indicate greater variability between the sediment collected (Table 5-3). The results for these samples are not similar. None of the VOCs reported in sample SS002 were reported in sample SS004. Many semivolatile compounds were reported in only one sample, and the compounds reported in both samples were at dissimilar concentrations. Some of the total metals analytes were reported at similar concentrations in the river sediment sample. Aroclor-1260 was only detected in sample SS002. Due to field sampling difficulties, samples SS002 and SS004 were not collected as composites.

Oily seep sediment samples (ORS01 and ORS02) reported higher concentrations of contaminants in sample ORS01 than those reported for sample ORS02. Ten contaminants (mostly semivolatile organic compounds) were reported only in one sample or the other. The remaining detected contaminants were reported in both samples.

The duplicate soil samples (surface and subsurface) were collected near the former railroad buildings located in the middle of the site. The results of these samples indicate

low levels of contamination with a slight variation in contaminants reported at significant concentrations. The duplicate subsurface soil sample data report similar contaminants at comparable concentrations. The reason for the variability between duplicate samples is not known.

5.6 SUMMARY

The objectives of this SI were to assess the potential for releases of hazardous constituents into the environment and the potential threat to public health or the environment posed by the site. The primary environmental threat documented at this site is the release of an oily material into the St. Joe River. The secondary threat to humans and the environment is the presence of contamination in the soils at this site.

The contaminants of concern at the ARDR site are solvents (VOCs), petroleum hydrocarbons (semivolatiles), metals, and PCBs (Section 2.2). Table 5-6 indicates the areas where significant levels of these contaminants of concern were detected. The sampling results are separated into groundwater, sediment, and site soil categories. The table identifies where the data report significant concentrations in the specific area, either on- or off-site.

No significant compounds were reported in the residential groundwater samples collected from local wells. These data indicate that contaminants from the ARDR are not present in the area groundwater. These data are not conclusive; no sample was collected of the on-site residential well nor of the wells located west (the assumed direction of groundwater flow) of the site.

The on-site well sample indicates that VOCs, semivolatile (PAH) compounds, and inorganic analytes are present in the groundwater below the site. These data support the information concerning reported release of solvents and fuel oils to the site by railroad operations.

Results from the upstream and downstream sediment samples did not indicate significant concentrations of contaminants of concern at this site. This information appears to indicate that the observed release of contaminants from the site (oily seep) into the St. Joe River are diluted or are not deposited. Contaminants of concern were reported at significant concentrations in the oily seep sediment samples and site river sediment

Table 5-6
Presence of Contaminants of Concern at ARDR

Location of Sampling	Volatile Organic Compounds (solvents)	Semivolatiles (solvents, petroleum hydrocarbons)	Total Metals	PCB
Off-site wells	No	No	No	No
On-site well	Yes	Yes	Yes	No
Site river sediments	No	Yes	Yes	Yes
Oily seep sediments	Yes	Yes	No	Yes
Downstream river sediments	No	No	No	No
On-site surface soils	Yes	Yes	Yes	Yes
On-site subsurface soils	Yes	Yes	Yes	Yes

samples (less than 100 feet downstream of the oily seep). These data confirm the observed release of visible oily seep contaminants to the St. Joe River.

Site soils contained significant concentrations of contaminants of concern. The presence of significant concentrations of PAH compounds at the ARDR site support the information concerning historical railroad activities. These compounds are associated with coal, oil, and gasoline. The fueling and maintenance activities conducted at this site would indicate the presence of these PAH compounds in site soils.

In general, the site data indicate the presence of significant levels of contamination in the groundwater below the site, the oily material seeping from the site, and on-site soils.

6.0 REFERENCES

Allen, Pat. 1992. Assistant Public Works Director for Shoshone County, Idaho. Personal communication with Michelle Wittenbrink, URS Consultants, Inc., April 20, 1992.

Davis, Bill. 1993. File Manager for the Potlatch Corporation. Personal communication with Kara Steward, URS Consultants, Inc., January 5, 1993.

Fish, Mike. 1992. Construction Services Manager for the Potlatch Corporation. Personal communication with Kara Steward, URS Consultants, Inc., May 5, 1992, and August 26, 1992.

———. 1991. Avery Landing Site—Proposed Remediation. Letter to Brian Painter and Lisa Prochnow of IDEQ, dated March 27, 1991.

Hart-Crowser, Inc. 1989a. Avery Idaho Site Preliminary Environmental Service. Letter to Mike Fish of Potlatch, dated August 23, 1989.

———. 1989b. Site Exploration Report, Avery Landing Site, Avery, Idaho. Letter to Mike Fish of Potlatch, dated October 27, 1989.

Idaho Department of Water Resources (IDWR). 1979. Well Driller's Report - Potlatch Corp. Northern Logging Unit. Well drilled on 12/10/79 by American Drilling, Spokane.

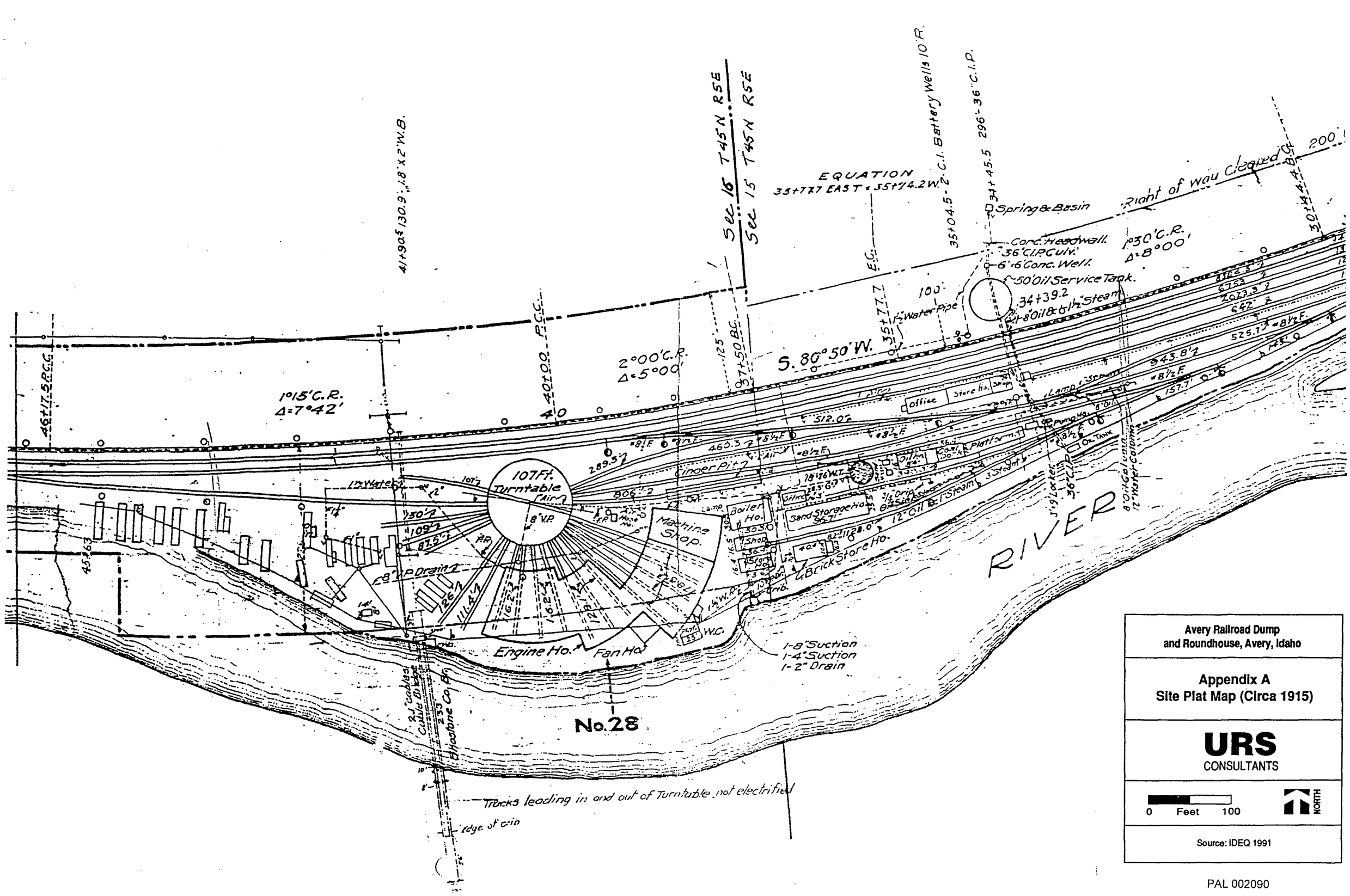
Idaho Division of Environmental Quality (IDEQ). 1991a. Avery Railroad Dump and Roundhouse PA Report.

———. 1991b. Avery Landing Site—Proposed Remediation. Letter from Brian Painter and Lisa Prochnow of IDEQ to Mike Fish of Potlatch, dated January 23, 1991.

International Air Transport Association (IATA). 1987. Dangerous Goods Regulations. 29th Edition.

APPENDIX A

SITE PLAT MAP
(Circa 1915)



Avery Railroad Dump and Roundhouse, Avery, Idaho

Appendix A
Site Plat Map (Circa 1915)

URS
CONSULTANTS

0 Feet 100

NORTH

Source: IDEQ 1991

PAL 002090

APPENDIX B

IDAHO WELL DRILLER'S REPORTS

1.

Form 238 7
1 78

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

7

1. WELL OWNER

Name Canyon School District

Address Caldwell, Idaho

Owner's Permit No. _____

2. NATURE OF WORK

☐ New well ☒ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) _____

3. PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other School District (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

5. WELL CONSTRUCTION

Casing schedule: ☐ Steel ☐ Concrete ☐ Other PVC

Thickness	Diameter	From	To
_____ inches	4 inches	11 feet	150 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☐ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No _____
Diameter ___ Slot size ___ Set from _____ feet to _____ feet
Diameter ___ Slot size ___ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☐ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth _____ Material used in seal: ☐ Cement grout
Existing ☐ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing
☐ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port _____

6. LOCATION OF WELL

Sketch map location must agree with written location.

N / W / E / S

Subdivision Name _____
Lot No. ___ Block No. _____
County Gooding
¼ ¼ Sec. 15 T 5S N.S. R. 15E E/W.

7. WATER LEVEL

Static water level 15 feet below land surface.
Flowing? ☐ Yes ☐ No G.P.M. flow 166 GPM
Artesian closed-in pressure _____ p.s.i.
Controlled by ☐ Valve ☐ Cap ☐ Plug
Temperature ___ °F Quality _____

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
166 GPM		

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
	105	150	gray shale		
	150	160	Broken shale	a	
			test 10 of hole		

10.

Work started 5-16-82 finished 5-18-82

11. DRILLERS CERTIFICATION -22

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Clarence Blaine Drilling, Inc. Firm No. 214

Address Hagerman, Idaho Date 5-20-82

Signed by (Firm Official) Fred Family

and

(Operator) Bill Family

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

PAL 002092

Form 238-7
9/82

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

2.

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Richard A. or Jay L. Packer

Address Bx 16 Avery, Id 83802

Owner's Permit No.

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other

Thickness	Diameter	From	To
.250 inches	6 inches	+ 2 feet	24 feet
inches	inches	feet	feet
inches	inches	feet	feet
inches	inches	feet	feet

Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation ___ inches by ___ inches

Number	From	To
perforations	feet	feet
perforations	feet	feet
perforations	feet	feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name
Type Model No.
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel
Placed from ___ feet to ___ feet
Surface seal depth 24 Material used in seal: ☐ Cement grout ☒ Bentonite ☐ Puddling clay ☒ Cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port

6. LOCATION OF WELL

Sketch map location must agree with written location.

N / W / E / S (section grid, X marked in SW corner)

Subdivision Name
Lot No. Block No.

County Shoshone

SW ¼ SW ¼ Sec. 15, T. 45 Ⓝ/S, R. 5 Ⓔ/W.

7. WATER LEVEL

Static water level 16 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow
Artesian closed-in pressure ___ p.s.i.
Controlled by: ☐ Valve ☒ Cap ☐ Plug
Temperature Cold °F. Quality Good
Describe artesian or temperature zones below.

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other

Discharge G.P.M.	Pumping Level	Hours Pumped
15	Variable	½ hr

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	16	Clay and Shale		X
	16	24	Shale		X
6	24	175	Shale	X	

RECEIVED JUN 1? 1985 Department of Water Resources Northern District Office

RECEIVED JUN ? 1985 Department of Water Resources

10. Work started 6/11/85 finished 6/12/85

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Associated Well Drillers Inc Firm No. 245

Address Box 723 C.D.A Date 6/13/85

Signed by (Firm Official) [signature]

and

(Operator) Robert F. [signature]

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

PAL 002093

3.

USE TYPEWRITER OR BALL POINT PEN

State of Idaho
Department of Water Administration

WELL DRILLER'S REPORT

[illegible]

1. WELL OWNER

Name: G.N.R. INC.

Address: AVERY IDAHO
Burlington Northern Inc.
650 Central Bldg.
Seattle, Wa. 98104

2. NATURE OF WORK

✓ New well — Deepened — Replacement

[illegible]

3. PROPOSED USE

☑ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type)

☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection

4. METHOD DRILLED

☐ Cable ✓ Rotary ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Diameter of hole 6 inches Total depth 125 feet

Casing schedule: ☑ Steel ☐ Concrete

Thickness		Diameter		From		To	
.250	inches	6	inches	+2	feet	22	feet
.250 PVC	inches	4	inches	25	feet	125	feet
	inches		inches		feet		feet
	inches		inches		feet		feet
	inches		inches		feet		feet

Was a packer or seal used? ☐ Yes ☑ No

Perforated? ☑ Yes [illegible]

How perforated? ☐ Factory ☐ Knife ☐ Torch

Size of perforation 1/4 inches by 1/4 inches

Number		From		To	
160	perforations	100	feet	125	feet
	perforations		feet		feet
	perforations		feet		feet

Well screen installed? ☐ Yes ☑ No

Manufacturer's name ______

Type ______ Model No. ______

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Gravel packed? ☐ Yes ☑ No Size of gravel ______

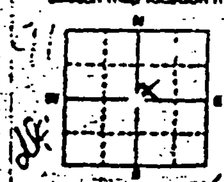
Placed from ______ feet to ______ feet

Surface seal depth 20 Material used in seal ☐ Cement grout ☑ Puddling clay ☑ Well cuttings

Sealing procedure used ☐ Slurry pit ☐ Temporary surface casing ☑ Overbore to seal depth

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name ______

Lot No. ______ Block No. ______

County SHOSHONE

SE ¼ NW ¼ Sec. 17 T. 45 N R. 5 E

7. WATER LEVEL

Static water level 20 feet below land surface

[illegible] ✓ [illegible] G.P.M. flow ______

Temperature [illegible] Quality Good

[illegible]

[illegible] ☐ Cap ☐ Plug

8. WELL TEST DATA

☐ Pump ☐ Bailer ✓ Other AIR

Discharge G.P.M.	Draw Down	Hours Pumped
25 G.P.M.		4 hrs.

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
6	0	23	[illegible] sand gravel		✓
6	23	125	[illegible] Quartz		
			Brown-Gray-white-red	✓	
			yellow		

10.

Work started [illegible] finished [illegible]

11. DRILLERS CERTIFICATION

Firm Name [illegible] Firm No. 116

Address C.d'A. Idaho Date [illegible]

Signed by (Firm Official) [illegible]

and

(Operator) [illegible]

USE ADDITIONAL SHEETS IF NECESSARY FORWARD THE WHITE COPY TO THE DEPARTMENT

PAL 002094

4.

Form ...
78

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

USE TYPEWRITER OR BALLPOINT PEN

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Potlatch Corp. Northern Unit Logging

Address Box 386 St. Maries, Idaho 83861

Owner's Permit No.

7. WATER LEVEL

Static water level 20 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow
Artesian closed-in pressure p.s.i.
Controlled by ☐ Valve ☐ Cap ☐ Plug
Temperature cold °F Quality good

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning)

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other

Discharge G.P.M.	Pumping Level	Hours Pumped
50 G.P.M.		

3. PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☒ Other Commercial Logging camp (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	18	fill sealed out water	x	
8	18	30	cemented gravel		x
8	30	31	soft area	x	
8	31	57	brown shale		x
8	57	58	fractured area	x	
8	58	60	brown shale		x
8	60	61	fractured area	x	
8	61	64	brown shale		x
8	64	67	fractures areas	x	

RECEIVED
DEC 1979
Department of Water Resources
Northern District Office

RECEIVED
DEC 1979
Department of Water Resources

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other

Thickness		Diameter		From		To	
.250	inches	8	inches	+ 1	feet	28	feet
.250	inches	6	inches	3	feet	67	feet
	inches		inches		feet		feet
	inches		inches		feet		feet

Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☒ Yes ☐ No
How perforated? ☐ Factory ☐ Knife ☒ Torch
Size of perforation ¼ inches by 12 inches

Number		From		To	
60	perforations	47	feet	67	feet
	perforations		feet		feet
	perforations		feet		feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name
Type Model No.
Diameter Slot size Set from feet to feet
Diameter Slot size Set from feet to feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel
Placed from feet to feet
Surface seal depth 18 Material used in seal: ☐ Cement grout ☒ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port welded

10. Work started 11/16/79 finished 11/26/79

6. LOCATION OF WELL

Sketch map location must agree with written location.

N / W / E / S

Subdivision Name

Lot No. 1 Block No.

County Shoshone

¼ ¼ Sec. 16, T. 46 N/S, R. 5 E/W.

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name American Drilling Firm No. 269

Address P.O. Box 14977 Spokane Date 12/10/79

Signed by (Firm Official) [signature]

and

(Operator) B.O. Murphy

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

300 yds downstream roughly well still in use well routinely tested

PAL 002095

APPENDIX C

CALCULATION FOR NET PRECIPITATION

URS CONSULTANTS, INC.

[redacted]

Calculation for Net Precipitation

Calculation performed according to HRS Final Rule
(40 CFR Part 300), Section 3.1.2.2 using formulas:

Date:	01/06/93	Individual of Data Entry:	Kara Steward	
Site:	Avery Railroad Dump and Roundh	Type of Temperture (C or F):	F	
Latitude:	47 12' 13.65" N	DATA Available Temperture or Evap. (D or E):	D	
Longitude:	115 49' 15" W	>Latitude (50,45,40,35,30,20,10,0):		45.00

(Fill in only the shaded spaces)

Net Precipitation = Monthly Precipitation - Evapotranspiration (E)

E(Jan..Dec) = 0.6*F(Jan..Dec)[10T(Jan..Dec)/I] ^ a

Variables:

E(Jan..Dec) = Monthly potential evapotranspiration, if E<0 then E=0 is used

F(Jan..Dec) = Monthly latitude adjusting value

T(Jan..Dec) = Mean monthly Temperature (Centigrade)

I = Sum[T(Jan..Dec)/5] ^ 1.514

a = 6.75*(10^-7)*(I^3)-7.71*(10^-5)*(I^2)+1.79*(10^-2)*I+0.49239

	Monthly Variables: Enter what is available			Calculated Variables					Difference Variables	
Month	Degree (C or F)	Precipitation	Evaporation	Variable T	Variable I	Variable a	Variable F	Variable E	Precip-Evap.	Positive P-E
Jan	23.80	5.66		-4.56	-0.40		0.80	-0.71	5.66	5.66
Feb	30.50	3.49		-0.83	-0.07		0.81	-0.10	3.49	3.49
March	36.90	3.28		2.72	0.40		1.02	0.50	2.78	2.78
April	44.60	2.68		7.00	1.67		1.13	1.63	1.05	1.05
May	53.00	2.78		11.67	3.64		1.28	3.30	-0.52	0.00
June	60.70	2.22		15.94	5.86		1.29	4.74	-2.52	0.00
July	66.00	1.43		18.89	7.58		1.31	5.84	-4.41	0.00
Aug	65.90	1.48		18.83	7.55		1.21	5.37	-3.89	0.00
Sept	55.90	2.22		13.28	4.43		1.04	3.11	-0.89	0.00
Oct	45.10	2.26		7.28	1.77		0.94	1.42	0.84	0.84
Nov	34.00	4.20		1.11	0.10		0.79	0.14	4.06	4.06
Dec	27.30	4.96		-2.61	-0.23		0.75	-0.35	4.96	4.96
Average Annual Precipitation		36.66								

Total I	Variable a
32.29	5780.25

TOTAL
22.83

[redacted]

NET PRECIPITATION= 22.83 INCHES

[redacted]

PAL 002097

AVERY R S 2 SHOSHONE County Station 100528

CLIMATOLOGICAL SUMMARY
Calendar Year 1968 -1989

DATE	TEMPERATURES (F)											PRECIPITATION (IN)										
	MONTHLY MEANS			DAILY RECORDS						DEGREE DAYS		TOTALS			DAILY			SNOWFALL			SNOWDEPTH		
MONTH	MAX	MIN	MNTH	HI	YR	DAY	LOW	YR	DAY	HEAT	COOL	MEAN	MAX	YR	HI	YR	DAY	MEAN	MAX	YR	MAX	YR	DAY
Jan	30.6	19.1	23.8	48	84	27	-17	79	1	1220	0	5.66	10.15	71	1.66	71	30	38.9	74.5	69	44	69	31
Feb	36.3	24.7	30.5	54	84	28	-20	85	4	981	0	3.49	8.00	72	1.25	71	10	19.0	40.0	72	48	69	2
Mar	45.2	28.6	36.9	75	78	30	0	76	4	888	0	3.28	5.81	89	1.60	84	23	4.6	13.7	70	33	72	4
Apr	55.8	33.3	44.6	88	87	29	21	73	7	622	1	2.68	4.60	74	1.07	70	24	0.5	3.8	70	23	75	1
May	66.7	39.0	53.0	91	88	23	24	88	5	371	8	2.78	5.27	84	1.50	79	5	0.0	0.0	.	0	.	.
Jun	75.7	45.7	60.7	98	87	15	30	83	29	159	41	2.22	5.36	81	1.35	71	27	0.0	0.0	.	0	.	.
Jul	83.3	48.6	66.0	102	85	9	34	71	7	59	95	1.43	3.87	83	1.27	81	7	0.0	0.0	.	0	.	.
Aug	83.4	48.2	65.9	104	69	23	34	69	29	54	92	1.48	4.26	76	1.10	75	22	0.0	0.0	.	0	.	.
Sep	70.2	41.6	55.9	99	88	4	24	70	14	274	12	2.22	4.44	86	1.83	76	23	0.0	0.0	.	0	.	.
Oct	56.0	34.2	45.1	84	87	7	11	71	29	609	0	2.26	6.05	75	1.27	89	21	0.5	6.0	71	2	71	31
Nov	39.1	29.1	34.0	62	87	1	1	82	23	924	0	4.20	6.98	89	1.87	82	22	7.8	26.4	75	20	75	30
Dec	31.6	22.9	27.3	50	77	4	-23	68	30	1164	0	4.96	10.43	77	2.80	77	1	25.9	61.4	71	28	71	15
ANNUAL	56.2	34.6	45.3	104			-23			7327	248	36.65	10.43		2.80			97.1	74.5		48		

2 yr 24 hr precip 1.8"

PAL 002098

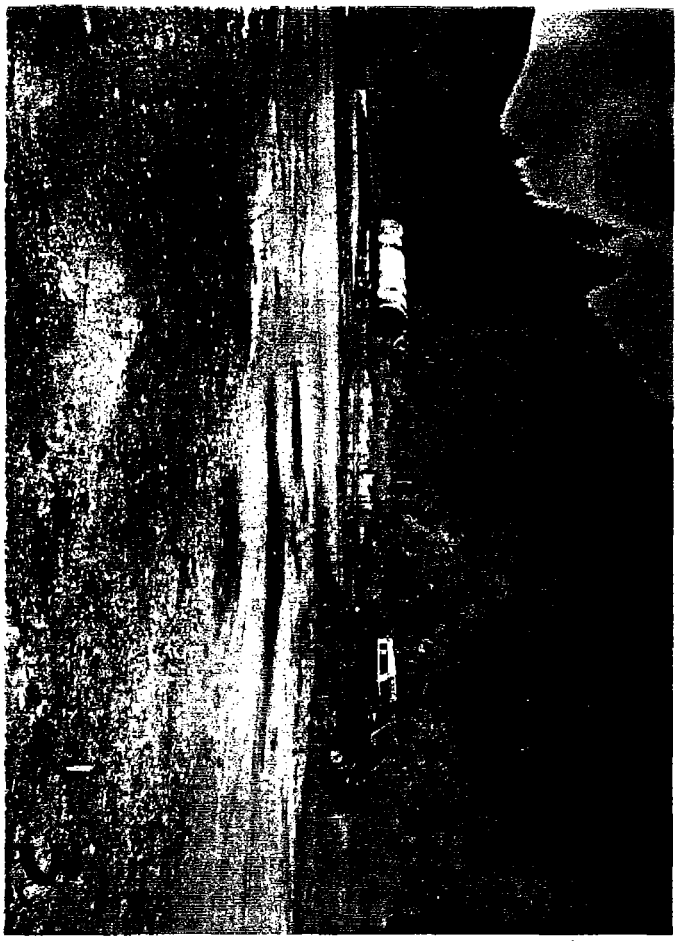
APPENDIX D

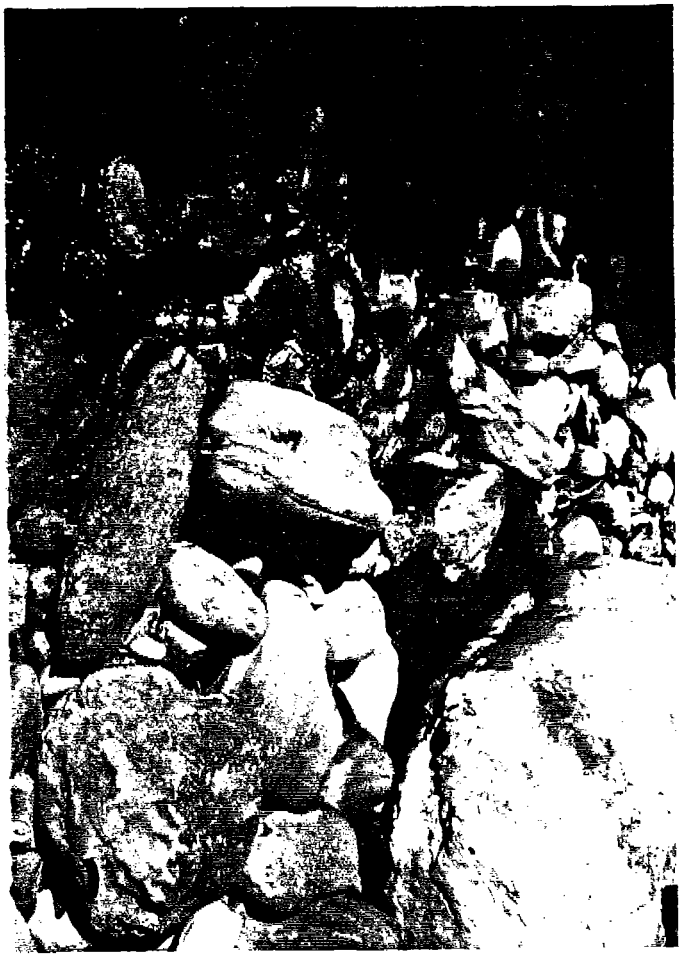
SITE VISIT AND SAMPLING PHOTO DOCUMENTATION LOG

URS Consultants	ARCS Photograph Log	DCL # 62760.05.20.144/15.b1	
Project Number: 4162760.05.07	Project/Site Name: Avery RR Dump & Roundhouse	Photographer(s) Signature(s): Kara Steward	
Camera Type: Cannon AE	Film Type/Speed: 200 ASA 35 mm	Roll Number: One	Date: August 25, 1992

Frame	Date	Time	Orientation	Subject
1	8/25/92	1200	SW	Oily seep area, location of samples ORS01 & ORS02.
2	8/25/92	1201	W	River and oil interface along site.
3	8/25/92	1210	W	Mule deer on site.
4	8/25/92	1210	NW	Mule deer on site; note Idaho road crew emissions.
5	8/25/92	1215	E	Mule deer on site.
6	8/25/92	1230	W	River bank view of upstream sediment sampling location. Looking toward site - (0.75 mile).
7	8/25/92	1230	W	View from river of upstream sediment sampling location.
8	8/26/92	0950	W	On-site monitoring well - MW-4 (Hart-Crowser Well).
9	8/26/92	0955	W	Oily material unable to be penetrated by bailer - level of oil = 10' below ground surface.
10	8/26/92	1010	S	MW-3 - removing grease pack from well to allow opening of well cap. - WMW01 sample. (Hart Crowser Well.)
11	8/26/92	1145	N	View of layered soil on site - sample site of SS03.
12	8/26/92	1155	SE	View of hole digging for sample SS04.

Date Delivered to Processor	Date Received from Processor	Comments
8/31/92	9/2/92	





2	8/25/92	1201	W

River and oil interface along site.

1	8/25/92	1200	SW

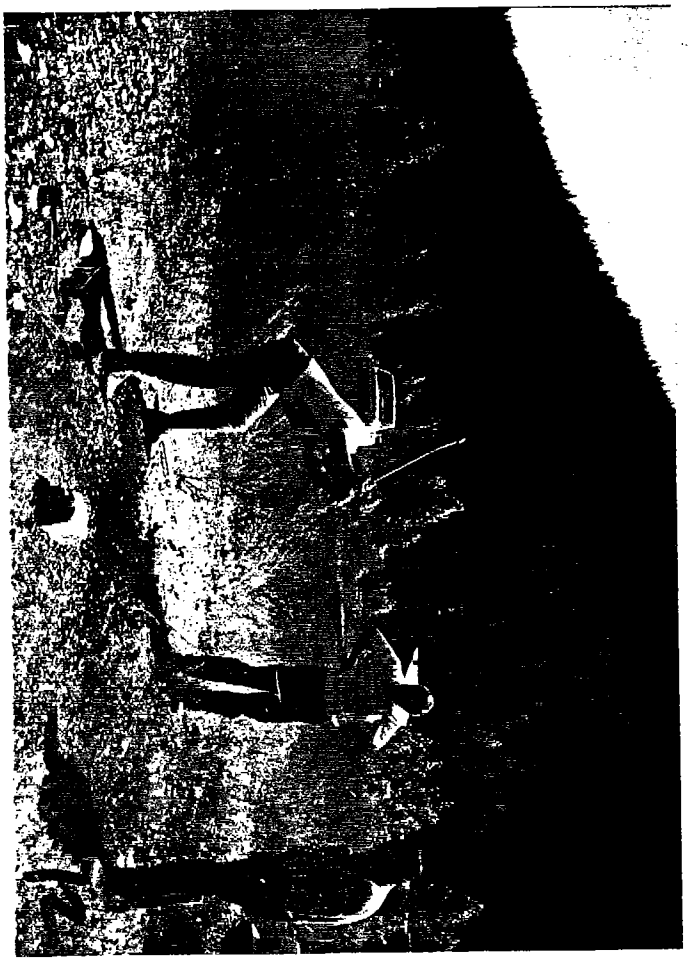
Oily seep area, location of samples ORS01 & ORS02.

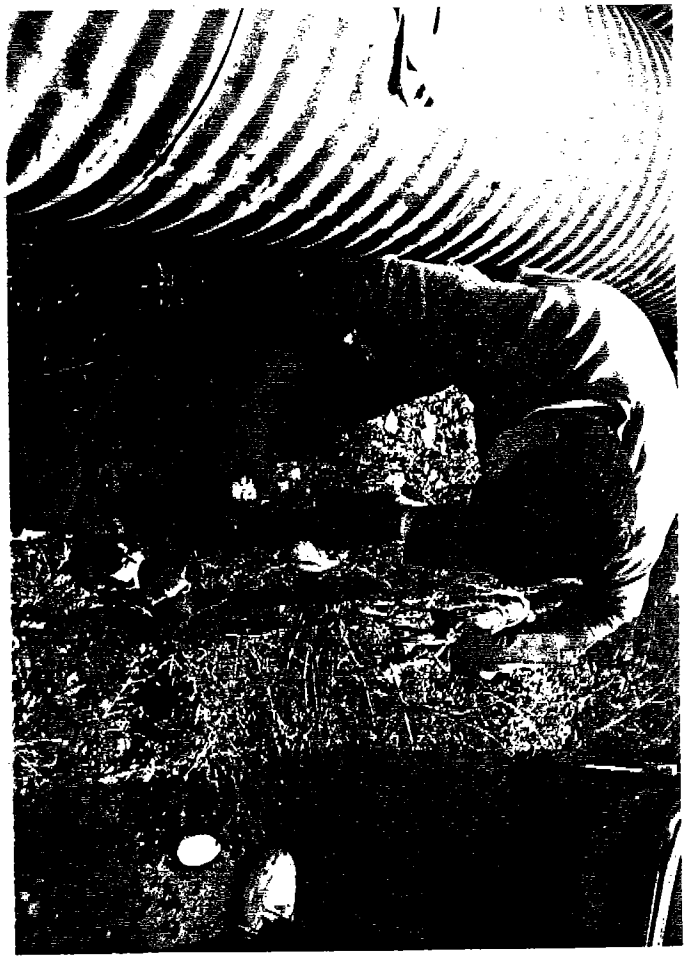
4	8/25/92	1210	NW

Mule deer on site; note Idaho road crew emissions.

3	8/25/92	1210	W

Mule deer on site.





10	8/26/92	1010	S

MW-3 - removing grease pack from well to allow opening of well cap. - WMW01 sample. (Hart Crowser Well.)

9	8/26/92	0955	W

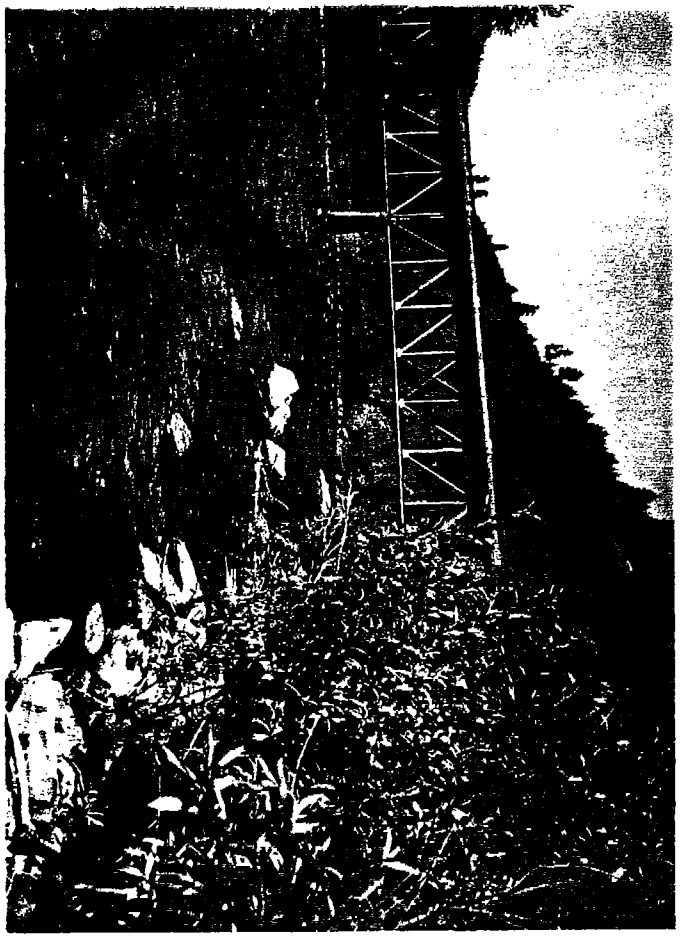
Oily material unable to be penetrated by bailer - level of oil = 10' below ground surface.

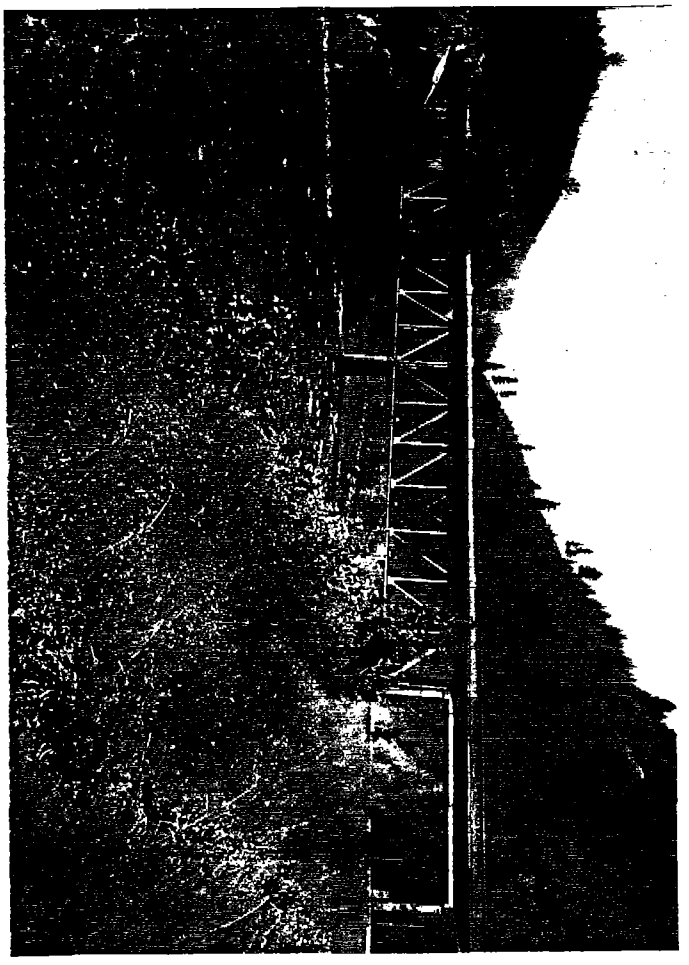
12	8/26/92	1155	SE

View of hole digging for sample SS04.

11	8/26/92	1145	N

View of layered soil on site - sample site of SS03.





6	8/25/92	1230	W

River bank view of upstream sediment sampling location. Looking toward site - (0.75 mile).

5	8/25/92	1215	E

Mule deer on site.

8	8/26/92	0950	W

On-site monitoring well - MW-4 (Hart-Crowser Well).

7	8/25/92	1230	W

View from river of upstream sediment sampling location.

APPENDIX E

DISCUSSION OF DATA QUALITY OBJECTIVES

APPENDIX E
DISCUSSION OF DATA QUALITY OBJECTIVES

Table E-1 summarizes data quality objectives and actual measures of these parameters for this SI.

Table E-1
Summary of Target and Actual Data Quality Objectives

Compound or Analyte of Interest	Accuracy		Precision		Completeness	
	Target %	Actual %	Target %	Actual %	Target %	Actual %
Volatile Organic Analysis	61-145	22-280	15	>30	100	92.3
Semivolatile Organic Analysis	9-145	41-122	50	>30	100	87.1
Pesticides/PCBs	38-127	20-146	30	15	100	92.3
Total Metals	75-127	5.3-119	20	20 (Pb=140)	100	92.3
Mercury	75-127	53-112	20	20	100	92.3

ACCURACY

Volatile Organic Analysis

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries for the water samples were within the target range except the recovery of one or both spike samples for trans-1,3-dichloropropene and cis-1,3-dichloropropene fell outside the EPA Region 10 acceptance range. The qualifier J was assigned to these analytes for sample WHC01. Recoveries ranged from 41 to 122 percent.

The MS and MSD recoveries for the soil samples were within the target range except the recovery of one or both spike samples and/or the percent difference for vinyl chloride, carbon disulfide, chloroethane, bromoform, bromomethane, chloromethane, 2-butanone, bromochloromethane, 4-methyl-2-pentanone, 2-hexanone, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, trichlorofluoromethane, and 1,2,3-trichlorobenzene fell outside the target range. The qualifier J was assigned to these analytes for sample SS05-2. All other recoveries or percent difference were acceptable. No additional data qualifiers

were required based on matrix spike recoveries. Recoveries for the MS/MSD ranged from 22 to 280 percent.

Semivolatile Organic Analysis

Recoveries for most of the water sample MS/MSD analytes were within the target range. One or both spike recoveries for four analytes—hexachloroethane, hexachlorocyclopentadiene, benzoic acid, and 3-nitroaniline—were outside the target range. All values for these analytes were given the qualifier J or UJ for the corresponding sample WSW02. No additional data qualifiers were required on the basis of MS/MSD results. Recoveries ranged from less than 50 percent to 122 percent.

Pesticides/PCBs

Target accuracy was met for the water samples. Target accuracy was not met for the soil samples. The samples ORS01 and SS004 analyzed for MS/MSD and the samples SS03-2 and SS03-1 contained high background, which required sulfuric acid treatment. This resulted in a low recovery for Endosulfan I and methoxychlor, as well as the total removal of Endrin and Dieldrin. These four pesticides are flagged with a J for those samples requiring acid treatment. The recoveries for the remainder of the pesticides were within the acceptable range. Recoveries for the MS/MSD ranged from 20 to 146 percent.

Total Metals

Target accuracy was met for the water samples. Target accuracy was not met for the soil samples. The recovery of at least one spike sample was low for antimony, lead, selenium, silver, and thallium. Both antimony and thallium exhibited low recoveries in all matrix spike samples, ORS01, SS003, SS02-1; thus, all antimony and thallium results were flagged with an N. Although lead exhibited poor matrix spike performance in sample SS02-1 (−240.6 percent to 80.6 percent), it was not flagged because the poor performance was a result of poor homogeneity. Selenium recoveries were low in matrix spike sample SS02-1 (70 percent) and therefore the results in the associated samples—SS02-1, SS02-2, SS04-1, SS04-2, SS06-1, and SS07-1—were qualified with an N. Silver recoveries were low in the matrix spike sample SS002 (67.4 percent, 70.1 percent) and therefore the results in the associated samples were qualified with an N. These samples include SS001, SS002, SS003, SS004, SS01-1, SS01-2, SS03-1, SS03-2, SS05-1,

SS05-2, SS06-2, and SS07-2. Recoveries for MS/MSD soil samples ranged from 5.5 to 119.3 percent.

Mercury

Matrix spike recoveries for the water samples were acceptable with the exception of one sample, WHC01. Mercury was flagged with an N because of slightly low recovery. Recoveries for MS/MSD water samples ranged from 71 to 112 percent.

All mercury results for the soil samples were flagged with an N based on the low recoveries (53 percent, 62 percent) from sample SS03-2.

PRECISION

Volatile Organic Analysis

Target precision was met for the water analysis. Target precision for soils exceeded 30 percent for several analytes.

Semivolatile Organic Analysis

Target precision for the water analysis exceeded 30 percent for eight compounds. All values for these specific analytes were given the qualifier J. The validation report does not provide adequate information to assess if the 50 percent precision target was met.

The continuing calibration response factor for 3-nitroaniline was low, resulting in this analyte being qualified as rejected.

Precision for soil samples was problematic. Results for two analytes, 3-nitroaniline and benzyl alcohol, were rejected. Several other analytes were J qualified.

Because of poor surrogate recoveries, the acid fractions of samples SS001, SS002, SS02-2, SS03-1, and SS07-1 were rejected.

Pesticides/PCBs

Target precision was met for both the water and soil analysis.

Total Metals

Target precision was met for the water analysis. Precision was problematic for the soil analysis due to the oily nature of the matrix. The samples underwent drying, particle reduction, and sieving in order to produce the best homogeneous mix possible. In the case of most analytes, these extra procedures helped to produce results with good precision. Lead was the only analyte that demonstrated consistently poor precision (RPD was 140 percent). The data were not qualified.

Mercury

Target precision was met for both water and soil analysis.

COMPLETENESS

Target completeness for this sampling effort was estimated to be 100 percent. The actual completeness for VOAs, pesticide/PCBs, total metals, and mercury is 92.3 percent. This is an acceptable level of completeness. Completeness was calculated to be 92.3 percent based on not collecting a second on-site groundwater sample and not using a second trip blank, as planned. Completeness for semivolatiles was further reduced, due to rejected laboratory analyses (see discussion for Precision), to 87.1 percent.

APPENDIX F

SAMPLE RESULTS
(August 25 and 26, 1992)

APPENDIX F

The following table presents the sample numbers in the following data reports that correspond to the sample identification numbers in the text of this report (refer to Table 4-1 for the description of the site sample location).

SI Report Sample Number	EPA Laboratory Number
WBW01 (VOCs only)	92352350
WAW01	92352351
WSW01	92352352
WSW02	92352353
WHCO1	92352354
ORS01	92352358
ORS02	92352359
SS001	92352360
SS002	92352361
SS003	92352362
SS004	92352363
SS01-1	92352364
SS01-2	92352365
SS02-1	92352366
SS02-2	92352367
SS03-1	92352368
SS03-2	92352369
SS04-1	92352370
SS04-2	92352371
SS05-1	92352372
SS05-2	92352373
SS06-1	92352374
SS06-2	92352375
SS07-1	92352376
SS07-2	92352377